California High-Speed Train Project

Agreement No.: HSR 13-06
Book 2, Part C, Subpart 1

Scope of Work

Revision No.	Date	Description
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7	14 Dec 12	Addendum 7
8	03 Jan 13	Addendum 9
9	31 Jul 13	EXECUTION VERSION

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PART C – Scope of Work

This Scope of Work covers the technical aspects of the Project. Other requirements are delineated elsewhere in the Contract Documents. Contractor shall refer to General Provisions for a list of general terms and definitions.

1 California High Speed Train Project (CHSTP) Standards and Manuals

Technical documents are provided to Contractor for direction and assistance during the Project's final design and construction, including but not limited to the following:

- California High-Speed Train Project (CHSTP) Design Criteria – Mandatory design criteria requirements Contractor shall follow and apply in the development of final design and construction documents, inclusive of Updates to Design Criteria document in Book 3.
- Directive Drawings – Directive Drawings provide mandatory design criteria in a graphical format Contractor shall follow and apply to ensure consistency during design for system-wide elements and features, inclusive of Updates to Directive Drawings document in Book 3.
- California High-Speed Train Project (CHSTP) CADD Manual – Mandatory drawing standards and format Contractor shall follow and apply in the preparation of design, construction, and as-built drawings.
- California High-Speed Train Project (CHSTP) Plan Preparation Manual – Mandatory plans format Contractor shall follow and apply in the preparation of design and construction submittals, and as-built drawings.
- Aesthetic Guidelines for Non-Station Structures – Mandatory aesthetic guidelines Contractor shall follow and apply to the design of non-station structures.
- Design Variance Request Process – Mandatory process document that Contractor shall follow and apply in the identification, preparation, and submittal of design variance requests, as necessary to achieve approval.
- Geotechnical Baseline Report for Bidding (GBR-B) – Mandatory document(s) which the Contractor shall use as the basis of its proposal. The GBR-B shall not be used for final design. The GBR-B is representative of the preliminary geotechnical investigations and interpretations performed to date by the Authority. The GBR-B is composed of two (2) separate documents:
    a. "Fresno to Bakersfield, Sierra Subdivision, Procurement Package 1, Geotechnical Baseline Report for Bid, November 2012"
    b. "Merced to Fresno, Sierra Subdivision, Geotechnical Baseline Report for Bid, Construction Package 1, Clinton Avenue, Fresno to Ave 17, Madera"

- Geotechnical Baseline Report for Construction (GBR-C) – Mandatory document, subject to Authority approval, which the Contractor shall prepare. Upon approval, the GBR-C shall replace the GBR-B. The Contractor may prepare and submit its GBR-C report(s) in a phased fashion. Along with the associated final design plans and specifications, the GBR-C shall serve as the basis for design and construction of the Project elements. Refer to Section 4.9.3 of this Scope of Work and CHSTP Design Criteria for additional information.
- Preliminary Ground Motion Data – Preliminary ground motion data that the Authority has prepared and Contractor shall use in seismic and structural design included in the proposal.
- Final Ground Motion Data – Final ground motion data that the Authority will prepare and Contractor shall use in seismic and structural design for preparation of design submittals, construction, and as-built drawings.
- Basis of Design – Policy document prepared by the Authority that defines the major components and performance objective of the CHST System, as defined in the Basis of Design document. Contractor shall use this document in the preparation of designs to ensure consistency with the components, objectives, processes, requirements, and assumptions governed by Authority policy.
- Record of Survey and Control Monument Data – Survey control data that the Authority has completed to date and Contractor shall use in its topographic survey and mapping for its design.
- Standard Specifications (for reference) – Technical specifications for use in Authority construction contracts, and as determined applicable by the Contractor. Standard Specifications are not considered mandatory for this Project, except for those sections or portions thereof identified in Attachment 5 "Mandatory Standard Specifications Listing" of this Scope of Work. Contractor's attention is further directed to Updates to Standard Specifications document in Book 4.
    a. Contracting Officer, as used in the Standard Specifications, shall be understood to mean the Authority Representative, as defined in the General Provisions.
- Standard Drawings (for reference) – Standard project elements for use in the construction of the California High-Speed Train system, as determined applicable by the Contractor. Standard Drawings are not considered mandatory for this Project. However, if Contractor chooses to use a Standard Drawing, the design as shown on that drawing shall be followed.

The Standard Specifications and Standard Drawings indicate a standard of quality to be achieved by the Contractor for the construction of the Project.

The identified technical documents above are found in Book 3 and Book 4.

2 Preliminary Engineering Documents

Preliminary design documents have been prepared to support environmental assessment and approval, and demonstrate technical feasibility and constructability.

The following preliminary engineering documents are provided to the Contractor for reference:

a. Design Plans:

   Excerpts from 15 percent design plans for Construction Package 1A Option 1 (Hybrid Alternative) – Initial design prepared by the Authority with the intent of supporting environmental assessment and approval.

   Preliminary design plans for Construction Package 1A, exclusive of the Hybrid Alternative, Construction Package 1B, and Construction Package 1C (Alignment F1) – Proposed preliminary design prepared by the Authority with the intent of demonstrating technical feasibility and constructability.

b. Preliminary Technical Reports – Technical reports prepared by the Authority to document data collection efforts completed to date and document the basis of the design for the proposed preliminary design and environmental documents.

   - Floodplain Impacts Assessment and Hydraulics and Hydrology Report
   - Stormwater Management Report
   - Geotechnical Data Report
   - Structures Report
   - Design Variance Report

c. Special Specifications – Proposed technical specifications with specific reference to the Preliminary Design Plans for Construction Package 1, and as determined applicable by the Contractor. Special Specifications are not considered mandatory for this Project, except for those sections or portions thereof identified in Attachment 6 "Mandatory Special Specifications Listing" of this Scope of Work. Contractor's attention is further directed to Updates to Special Specifications document in Book 4.

d. Electronic Files – Available electronic files used in the preparation of the preliminary design documents.

   - Design Files
     - Topographic Mapping
     - Digital Terrain Model (DTM)
     - Alignment Geometry Files (ALG)
     - Design Cross Sections
     - Sheet DGN Files
   - Existing Utility Data
   - GIS Files for Environmentally Sensitive Areas
   - Geotechnical Electronic Data

The Design Variance Report is found in Book 3. The remaining above-identified Preliminary Engineering documents can be found in Book 4.

The Preliminary Engineering Plans, Reports, and Special Specifications are based on preliminary design efforts and investigations and are provided for reference, unless otherwise specified for specific elements in this Scope of Work. If Contractor chooses to use the proposed preliminary design, Contractor shall review and validate that design meets CHSTP Design Criteria, Directive Drawings, local jurisdictional authorities' design criteria, and/or other requirements before advancing design to a baseline level (see Design Services section of this Scope of Work).

3 Project Description and Limits

Construction Package 1 (CP1) is located within the counties of Madera to the north and Fresno to the south, and the City of Fresno in the southern area. It is composed of four segments: Hybrid Alternative of Construction Package 1A, the remaining alignment of Construction Package 1A, Construction Package 1B, and Construction Package 1C.

General Project limits, from north to south, are described below. Refer to Attachment 1 "Limits and Extents of Work Table", Attachment 2 "Limits of Work Map", and Attachment 2a "Caltrans Limits of Work Map" for additional information.

- Construction Package 1A (CP1A), Hybrid Alternative – South of Avenue 17 to North of Veterans Boulevard (alignment generally along the existing BNSF Railway)
- Construction Package 1A (CP1A), Remaining alignment: North of Veterans Boulevard to north of Stanislaus Street. The limits within this package include a portion of work that is being performed by Caltrans.
- Construction Package 1B (CP1B): North of Stanislaus Street to South of Santa Clara Street
- Construction Package 1C (CP1C), Alignment F1: South of Santa Clara Street to South of East American Avenue

Description and major elements of each segment are described in the following sections.

3.1 CP1A, Hybrid Alternative Segment– South of Avenue 17 to North of Veterans Boulevard (alignment generally along the existing BNSF Railway)

The northern terminus of Hybrid Alternative is near Avenue 17 in Madera County. Traversing southward, the alignment parallels the west side of the BNSF tracks for approximately four miles before turning towards the Union Pacific Railroad (UPRR) south of Madera. The alignment follows the east side of the UPRR and transitions from at-grade to an elevated section to cross over the San Joaquin River. South of the river crossing, the elevated section continues over the UPRR tracks and transitions to an at-grade configuration west of the UPRR near Herndon Avenue. This segment terminates north of Veterans Boulevard and is approximately 15 miles in length.

The majority of the construction will be on embankment approximately 4 to 5 feet high. Major structural elements for consideration are three major bridges at the Fresno River and SR145, Cottonwood Creek, and the San Joaquin River. The work will be subject to seasonal construction constraints as defined in the Final Environmental Documents. In addition, there are nine 2-lane grade separated structures. The San Joaquin River Bridge is approximately 2.3 miles long. Construction includes demolition, site clearing, utility relocations, roadway construction, and compliance with the applicable requirements, mitigation measures identified in the Final Environmental Documents, and agreements between the Authority and applicable Third Parties.

3.2 CP1A, Remaining Alignment Segment – North of Veterans Boulevard to North of Stanislaus Street

This segment is approximately 5.5 miles in length, exclusive of the portion of Work to be completed by Caltrans, and runs adjacent to the west side of the UPRR. From Veterans Boulevard to approximately Olive Avenue, the alignment runs nominally at-grade. In the vicinity of Olive Avenue, the alignment begins its descent into a below-grade section, approximately 1.7 miles in length. Between Olive Avenue and Belmont Avenue, the below-grade section is further constrained by Roeding Park to the west, UPRR to the east, and an existing 96-inch storm drain pipe. On the south side of Belmont Avenue, the below-grade section is also constrained by a drainage basin. Continuing south of Belmont Avenue, the below-grade section passes under two active San Joaquin Valley Railroad (SJVR) spurs, Dry Creek Canal, and SR-180 before returning to a nominal at-grade section through to the end of CP1A just north of Stanislaus Street. The proposed design to cross under SR-180 is a 2-track box approximately 300 to 400 feet in length.

Additional major construction elements include four (4) grade separations at Shaw, McKinley, Olive, and Belmont Avenues, realignment of Golden State Boulevard, demolition, site clearing, and utility relocations, and compliance with the applicable requirements, mitigation measures identified in the Final Environmental Documents, and agreements between the Authority and applicable Third Parties.

Olive and Belmont Avenues shall be designed and constructed as offline alignments to minimize impacts to the existing roadways during construction. Contractor's attention is directed to the reference preliminary designs in Book 4.

Portion of work to be performed by Caltrans includes realignment of SR-99 from Station A92+20 to A237+30, including new interchanges at West Clinton Avenue and Ashlan Avenue, on and off ramps to and from Golden State Boulevard, plus the portion of High-Speed Rail infrastructure from Station S10691+50 to S10825+60, including demolition, site clearing, and utility relocations. Refer to Attachment 2b "Caltrans Scope of Work Map".

Portion of work to be performed by City of Fresno includes design and construction of the proposed Veterans Boulevard overcrossing. The facilities that the City of Fresno will complete include:

- Construction of Veterans Boulevard overcrossing (i.e. over the HSR alignment and UPRR)
- Construction of Veterans Boulevard connectors to the realigned Golden State Boulevard
- Construction of Veterans Boulevard and West Bullard Avenue

Contractor's attention is directed to Attachment 2c "City of Fresno Scope of Work Map – Veterans Boulevard", as well as section 3.5 of this Scope of Work concerning Contractor's responsibility to coordinate its design with Third Parties. The exact limits and conforms between Contractor's scope and City of Fresno's scope shall be confirmed during the Interface Coordination and Design Integration Workshops with the Authority. The design and construction of Golden State Boulevard shall remain in Contractor's Scope.

3.3 CP1B Segment – North of Stanislaus Street to South of Santa Clara Street

This section is approximately one mile in length and runs nominally at-grade, from the north side of Stanislaus Street to south of Santa Clara Street. It includes the future High-Speed Train Fresno Station and must accommodate the future 4-track and 6-track section(s), which include two storage tracks immediately south of the future Fresno station (one on each side of the station tracks), necessary for operation of the CHST.

Major work elements for this section include necessary civil work for the at-grade track section and four (4) grade separations at Stanislaus Street, Tulare Street, Fresno Street, and Ventura Street, demolition of existing Tuolumne Street overcrossing, reconfiguration of local streets per City of Fresno requirements, as well as demolition, site clearing, and utility relocations, and compliance with the applicable requirements, mitigation measures identified in the Final Environmental Documents, and agreements between the Authority and applicable Third Parties.

Contractor shall design and construct Stanislaus Street as a bi-direction facility, and Tulare, Ventura, and Fresno Streets as undercrossings (i.e. under the HSR alignment). The UPRR shoo-fly required to accommodate the construction of the Tulare Street and Ventura Street crossings under the proposed HSR alignment shall be included within the CP1B limits of work.

3.4 CP1C, Alignment F1, Segment – South of Santa Clara Street to South of East American Avenue

This segment is approximately five miles in length and runs adjacent to the west side of the UPRR after crossing SR-99, via an aerial structure, and adjacent to the west side of BNSF. From south of Santa Clara Street, the alignment passes under SR-41 and runs nominally at-grade to approximately East Belgravia Avenue. In the vicinity of East Belgravia Avenue, the alignment begins to descend into a shallow cut section, approximately one mile in length, to pass under existing East Jensen Bypass. As it approaches South Orange Avenue, the alignment transitions

to a 1.2 mile aerial structure, passes over Golden State Boulevard, SR-99, and South Cedar Avenue, before returning to grade to cross under East Central Avenue and through to the end of CP1C, south of East American Avenue.

Major construction elements for this segment include civil works for the at-grade track sections and three grade separations. Close coordination with Caltrans will be required on the planned improvements for South Cedar Avenue and impacts of the CHSTP aerial structure to SR-99.

The construction effort will also include demolition, site clearing, utility relocations, and compliance with the applicable requirements, mitigation measures identified in the Final Environmental Documents, and agreements between the Authority and applicable Third Parties.

3.5 Limits of Work for Enabling Facilities

As described above, Contractor's scope of work includes a number of grade separations, and associated roadway reconstructions, railroad relocations, and utility works owned by Third-Party Entities. These include the following:

- California Department of Transportation (Caltrans)
- City of Fresno
- County of Madera
- County of Fresno
- Union Pacific Railroad (UPRR)
- San Joaquin Valley Railroad (SJVR)
- BNSF Railway
- Utility companies
- Flood Control Districts (Fresno Metropolitan Flood Control District, Fresno Irrigation District, Fresno County Flood Protection Board)
- Other permitting agencies as noted in Book 3 of the Contract Documents

Contractor shall be responsible for coordinating and confirming the limits of work described above to ensure conformance with:

- Final Environmental Documents
- Local jurisdictional entity requirements
- Third-Party Agreements
- Direct coordination with the impacted third parties

- Other works required to support future CHSTP elements through Interface Coordination and Design Integration Workshops with the Authority.

Based on preliminary engineering and Third-Party coordination efforts achieved to date, Contractor shall be aware of the following local conditions that have informed the preliminary design included in Book 4. As delineated in this Scope of Work, Contractor shall be responsible for confirming these and all other design and location issues with the impacted Third Parties through the course of final design and construction. These include but are not limited to the following items:

- Maintenance and access provisions as required by the local irrigation and flood control districts.
- Compliance with most recent and adopted general and/or long-range plans for/by Caltrans and the cities and counties of Madera and Fresno.
- Compliance with local and state regulations with regard to impacts to sensitive areas, such as campgrounds and schools.
- Veterans Boulevard – do not preclude future Veterans Boulevard work, inclusive of connectors (to be completed by others)
- S. Cedar Ave – consider future 2-lane widening and profile raise of 2.5 feet.
- SR99 in South Fresno – do not preclude future Caltrans widening in median or outside shoulders.
- Fresno St. undercrossing (i.e. under HSR alignment) - preserve existing UPRR grade separation to minimize disruption to freight operations.
- Belmont Ave and Olive Ave - offset proposed grade separations to maintain traffic on the existing roadways as long as possible.
- Jensen Ave - identified as Extra Legal Load Network roadway; traffic must be maintained at all times, as well as extra vertical clearance requirements.
- Box under SR180 - extend under entire Caltrans ROW for SR180 to preserve future Caltrans improvements.
- Avoid impacts (temporary and permanent) to Roeding Park.
- Work in the vicinity of the existing Golden State Boulevard ramps will require coordination with the City of Fresno. The City of Fresno is responsible for the demolition of these ramp structures just north of SR41.

4 Project Scope of Work

4.1 General

Contractor's Work is defined as all services, labor, materials, equipment, and other efforts to be provided and performed by the Contractor including the following general categories:

- Scheduling
- Utility protection and relocation
- Demolition
- Removal of hazardous materials
- Permitting
- Survey
- Mapping
- Geotechnical
- Design
- Environmental mitigation
- Landscaping in accordance with Mitigation Monitoring and Reporting Program (MMRP) in the final environmental documents
- Construction
- Quality control and quality assurance for design and construction
- Community relations
- Quality inspection and testing
- Verification and validation
- Construction safety and security
- Preparation of CADD As-Built and Consolidated Services Drawings
- Implementation of Contractor's warranty for the Project after construction completion
- Coordination with jurisdictional authorities (governments, public, and private entities), utility companies, railroad companies, and local communities
- Design and construction of permanent improvements necessary as part of right-of-way acquisitions, including but not limited to improvements related to maintenance of access for specific properties and/or grade separations (i.e. driveways and/or other conforms). Contractor shall ensure positive drainage for all improvements.

- Other efforts necessary or appropriate to complete the design and construction of the Project, and to ensure the Project's ultimate readiness for high-speed rail passenger operations

The exceptions to this list include those efforts that the Contract specifies will be performed by the Authority or other Persons.

Contractor shall provide design and construction for CHSTP trackway civil infrastructure, complete in place, with the exception of CHSTP trackway from Station S10691+50 to S10825+60 which will be performed by Caltrans. While Caltrans performs the design and construction of this portion of the CHSTP trackway civil infrastructure, Contractor shall be responsible for establishing and controlling the plan and profile of CHSTP alignment in Caltrans portion of the work.

Contractor shall identify, design, install, and maintain a temporary protective layer over the trackway subgrade to protect the subgrade from degradation through the warranty period. Degradation refers not only to erosion of fill/existing soils as a result of rainfall and wind, but also to potential damage caused by animal burrowing, vandalism, and other environmental factors (such as flooding) not evident at the time of construction.

Contractor shall design and install structural embedments such as anchor bolts, embeds, grounding, and bonding, foundations, etc., as needed, in structures, walls and subsurface infrastructure to accommodate future CHSTP systems components not in the Project scope.

Contractor shall design and construct enabling works, such as grade separations and intrusion protection, complete in place. The enabling work shall be coordinated, designed, and constructed in accordance with the Third-Party Entity's requirements (i.e., City of Fresno, County of Fresno, California Department of Transportation, railroads, etc.). If the enabling work such as grade separations and intrusion protection are located above or below or immediately adjacent to the CHSTP alignment, in no case shall the enabling work be constructed to standards less stringent than the CHSTP Design Criteria if their failure would have the potential for damaging or otherwise interrupting HST service.

The Scope of Work does not include construction of the portion of CHSTP trackway performed by Caltrans as stated above; trackwork itself; passenger stations; buildings; right-of-way engineering, negotiations, and acquisition; soundwalls (except the soundwalls along the Roeding Park in downtown Fresno, which shall remain in Contractor's scope); and systems work (i.e., Overhead Contact System poles, foundations, and wires; Traction Power Facilities; Automatic Train Control; etc.). The Scope of Work excludes civil/site works for said future CHSTP systems facilities and ancillary sites, unless noted otherwise (i.e., civil preparatory works are generally limited to the improvements required for the CHSTP trackway only). However, while these elements are not included in the Scope, Contractor shall coordinate interfaces and ensure accommodation and integration of future CHSTP work elements via the Interface Coordination and Design Integration Workshops with the Authority, inclusive of such excluded facilities within the portion of work performed by Caltrans.

Contractor is further responsible for the following:

- Design and construction of the civil infrastructure elements as generally described above and identified in further detail in Attachment 3 "Scoping Typical Sections" and Attachment 4 "Scope Elements Matrix". The Work shall be performed and completed in accordance with the documents as defined in Sections 1 and 2 of this Scope of Work, as well as agreements, design criteria, standards, and permits by Third Parties for facilities within their jurisdictions. Contractor shall refer to the Project Elements section of this Scope of Work.
- Contractor's design and construction shall be completed such as to ensure the Project's ultimate readiness for high-speed rail passenger operations. Note that design speed shall be 250 miles per hour (see 4.2.1.1 in this Scope of Work).
- Accommodation of future CHSTP elements and facilities to be designed and constructed by others that affect the civil infrastructure as identified in this Scope of Work and through the Interface Coordination and Design Integration Workshops, including but not limited to the following:
  - Trackwork
  - Traction Power Facilities
  - Overhead Contact System
  - Automatic Train Controls Facilities
  - Communications
  - Rolling Stock
  - Operations
  - Maintenance Access/Emergency Access/Egress from Trackway (Ladders and Stairs)
  - Future high-speed rail passenger stations
  - Soundwalls
- Preparation of design and construction submittals in accordance with this Scope of Work.
- Preparation of Construction Specifications in accordance with this Scope of Work.
- Coordination with Third-Party Entities, including the following:
  - Local, Regional, State, and Federal Agencies
  - Railroads
  - Utility Companies
  - Other Permitting and Regulatory Agencies

4.2 Design Services

4.2.1 Review of Design Criteria, Drawings, Reports and Specifications

Contractor is responsible for review of the CHSTP Design Criteria, Preliminary Engineering Drawings and Reports, Standard Drawings, Directive Drawings, Standard Specifications, and Special Specifications for completion of design and construction of the Project.

4.2.1.1 CHSTP Design Criteria

Design Criteria has been prepared to direct the development of Contractor's final design, construction drawings, and construction specifications for the Project. Contractor shall develop the alignment using the CHSTP Design Criteria to achieve a design speed of 250 mph.

Contractor shall document the applicability assessment in the Requirements Verification Traceability Matrix (RVTM), including identification of each criterion that is determined by the Contractor to not be applicable to the Project. RVTM is described in more details in Verification, Validation and Self-Certification in Book 3 of the Contract Documents.

Contractor shall review the CHSTP Design Criteria and determine applicability of each criterion.

Contractor shall refer to the Authority's Design Variance Guidelines and CHSTP Design Criteria in Book 3 of the Contract Documents for definition on design variance process and criteria thresholds, respectively. Design Variance Requests are location-specific. Design Variance Requests are subject to Configuration Management and Change Control. Contractor shall not assume that additional Design Variance Requests, beyond those included in the Preliminary Design Variance Report provided in Book 3 of the Contract Documents, will be approved. Refer to Design Variances (Section 4.14) in this Scope of Work.

4.2.1.2 Preliminary Engineering Documents: Drawings and Reports

The 15% Design and Preliminary Engineering Drawings are at various design levels and are provided for Contractor's reference.

Contractor shall review the Preliminary Engineering Design Drawings and Technical Reports and confirm technical feasibility and constructability within the requirements of the approved Final Environmental Documents and the applicable CHSTP Design Criteria and Directive Drawings as described in this Scope of Work.

Contractor shall substantiate the technical feasibility and constructability of the design in the Baseline Design Report. This report will serve as a baseline document for configuration management, and will be subject to change control.

Contractor shall be responsible for the preparation of Construction Drawings and Reports.

4.2.1.3 Specifications

Contractor shall be responsible for the preparation of Construction Specifications.

CHSTP Standard Specifications were developed to support design and construction and are provided for Contractor's reference. Standard Specifications are not considered mandatory for this Project, except for those sections or portions thereof as identified in Attachment 5 "Mandatory Standard Specifications Listing" of this Scope of Work.

Contractor shall review CHSTP Standard Specifications and Special Specifications, and determine applicability of each specification section to Contractor's final design and construction methods, and determine what additional specifications are required. This review shall include the reference standards as referenced/included in the Standard Specifications. Contractor shall implement whatever changes are necessary to the Standard Specifications, including Mandatory Standard Specifications, to suit the specifications to Contractor's design and construction.

The registered professional engineers who prepare the Construction Specifications, in signing and sealing the Construction Specifications, shall be responsible for the Construction Specifications suitability to the design and construction and compliance to the Design Criteria and other Contract provisions. Their responsibility shall encompass the Standard Specifications provisions invoked and made applicable through the Construction Specifications.

Construction Specifications shall be prepared in accordance with the formats of CHSTP Standard Specifications, which are based on Construction Specifications Institute (CSI) MasterFormat™ 2011 edition and SectionFormat™ 2009 edition, and the following requirements: where Contractor has confirmed applicability of CHSTP Standard and Special Specifications sections, with or without modification, Contractor shall incorporate each applicable Standard and Special Specifications section into its Draft Construction Specifications. Contractor shall incorporate sections with no or minor changes by reference with a description of changes. Contractor shall incorporate sections with extensive changes in their entirety in track change format, as needed. For Contractor-added specifications not included as part of the CHSTP Standard and/or Special Specifications, Contractor's Draft Construction Specifications shall include "NEW" in bold capital letters in the top margin of the new Contractor-developed Construction Specifications section.

The Contractor shall require construction-phase submittals in its Construction Specifications sections similar to those listed in the Standard Specifications.

4.2.1.4 Fresno Street Construction Plans and Specifications by Caltrans

Caltrans has prepared construction plans and specifications for the Fresno Street roadway undercrossing. These plans have been included in Book 4 for Contractor's reference. Contractor shall be responsible for achieving an integrated design and construction, inclusive of the Fresno Street improvements, the high-speed rail infrastructure, and securing concurrence, permits, and approvals. Contractor may choose to use the reference plans prepared by Caltrans at its sole discretion, and shall not rely on them without completing due diligence per Contractor's design-build responsibilities.

4.2.2 Review of Environmental Documents

Before completing its technical and engineering reports and construction drawings, Contractor shall conduct a review of and ensure compliance with all Final Environmental Documents and Governmental Approvals. Compliance shall be demonstrated through preparation of environmental compliance reports, to be submitted with each design deliverable. Contractor shall be responsible for obtaining required permits for construction of the Project, except as indicated in Approach for Obtaining ICS Environmental Approvals/Permits in Book 3.

4.3 Additional Data

Contractor shall be responsible for obtaining additional data, including:

- Final identification, confirmation, and potholing for existing utilities.
- Survey and topographic mapping for final design, including site surveys as required. Available photogrammetric data used for preliminary design is provided for Contractor's reference.
- Collecting additional geotechnical information to complete the Project; support the finalization of ground motions work and fault rupture data; and prepare technical reports, including the GBR-C, construction drawings, and construction specifications. Contractor shall store, maintain, and make available its acquired geotechnical core samples until final acceptance and close out of Contract.

4.4 Design and Code Analysis

Contractor shall review and analyze current design, industry and regulatory design and construction codes, including those referenced in the Final Environmental Document, and third parties' requirements for applicability to its design and construction of the Project.

Contractor shall identify applicable design, industry, and regulatory construction codes by resource from the EIR/EIS and by affected Third-Party Entities in a Design and Code Analysis Report, which shall be submitted to the Authority. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

4.5 Certification Program

Contractor shall be responsible for safety and security certification activities during the Final Design and Construction phases of the Project. Contractor shall develop and submit a Safety and Security Certification Plan that describes in detail how Contractor will identify, mitigate, verify/validate, and certify safety and security requirements. The Safety and Security Certification Plan requirements are described in detail in the CHSTP Safety and Security Management Plan in Book 3 of the Contract Documents. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3.

4.6 Interface Coordination and Design Integration

Contractor shall be responsible for coordinating the interfaces and performing design integration with adjacent contractors, third parties, and the Authority, as specified in the General Provisions.

4.7 Verification and Validation and Self Certification

Contractor shall develop and implement a verification and validation (V&V) process to confirm to the Authority that by examination and provision of objective evidence the Technical Contract requirements and the particular requirements for specific intended use have been fulfilled. With every Technical Contract submittal to the Authority, Contractor shall provide a V&V submittal self-certifying compliance with the Technical Contract requirements and fitness for purpose. Every Technical Contract submittal shall be fully checked and certified by an Independent Checking Engineer (ICE) and Independent Site Engineer (ISE) before they are submitted to the Authority.

Refer to Book 3 for V&V and Self-Certification requirements.

4.8 Value Engineering

Contractor shall initiate, conduct, complete, and implement Value Engineering (also referred to as Value Analysis) upon approval of its Design Baseline Report. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3. Value engineering shall comply with methodologies and procedures adopted by Caltrans, including but not limited to Project Development Procedures Manual (PDPM), Chapter 19 – Value Analysis, Value Analysis Report Guide, and Value Analysis Team Guide, and shall be performed in coordination with the Authority. Contractor shall refer to value engineering process requirements specified in the General Provisions of the Contract Documents.

Further Contractor-initiated value engineering opportunities can be initiated, conducted, and implemented through final design and construction efforts.

4.9 Design Reports

Contractor shall provide Design Reports to the Authority as specified in this Scope of Work, the CHSTP Design Criteria, and other mandatory documents included in the Contract Documents. Contractor shall include hard copies and an electronic file posted in accordance with the direction provided in the General Provisions.

Unless otherwise noted, for Design Reports, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

Contractor shall include in the baseline schedule each Design Report and Authority review period, including breakdown by Construction Package Segment and/or structure.

4.9.1 Design Baseline Report

Contractor shall prepare a Design Baseline Report that defines the major design elements to be progressed to design and construction, and confirms technical feasibility, constructability, and compliance with the approved Final Environmental Documents, including the following:

- Final Track Alignment and Limits of Construction Activities
  - Plan and profile for the CHSTP track alignment for the entire limits of the Project, including the portion of the Work within Caltrans Scope of Work and location of all special trackwork. The limits of track alignment shall extend beyond Contractor's construction limits to the nearest point of tangency in plan and profile to ensure consistency, interface, and integration requirements with future work and in full support of High-Speed Train operations.
  - Typical sections for CHSTP trackway for at-grade, grade separated structures, and trenches, third-party facilities, as well as facilities constructed by others that affect Contractor's design. Typical sections shall identify and address future traction power, overhead contact system, communications, train controls, operations, and maintenance equipment. CHSTP facilities by others shall be confirmed during the Interface Coordination and Design Integration Workshops. CHSTP facilities by others shall be identified as "NIC" (Not in Contract) on the drawings.
- Trackside access - Trackside access driving gates shall be provided at Authority facility locations. If this cannot be provided due to site constraints, an alternative method of providing vehicular access to the trackside from the Authority facility shall be submitted to the Authority for review and approval as part of this Design Baseline Report.
- Clearances at Structures and Restricted Locations – Proper clearances in conformance with CHSTP Design Criteria at all grade separations and future CHSTP facilities by others that affect the design, including substation locations, radio antenna sites, special trackwork, signal houses, access and egress, and location of the system's undertrack ductbank and manholes.
- Structure Plans, Elevations, and Typical Sections – For grade separated structures, viaducts, bridges, trenches, tunnels, and retaining walls. Drawings shall include preliminary nominal dimensions of the structures subject to final design calculations.
- Railroads - For relocation of, or modification to, existing railroad trackways and other facilities per agreements with such entities.
- Utilities – Relocation of utilities within Authority's and state and local jurisdictions' right-of-way in accordance with applicable state and federal regulations.
- Geometric Approval Drawings – For relocation of, or modification to, state highway facilities and local roadways, as agreed with the affected third-party agency.

- Storm Water Pollution and Protection Plan (SWPPP) and Best Management Practices (BMP)
- Consistency with Final Environmental Documents – describing whether and to what extent the Baseline Design remains consistent with the Project described in the Final EIR/S and the environmental analysis provided therein.
- Aesthetic Design and Review for Non-Station Structures – See Aesthetic Design and Review for Non-Station Structures Report requirements as delineated elsewhere in this Scope of Work.
- Future systems works – Contractor shall demonstrate provisions for future ("NIC") systems elements such as traction power system (TPS), overhead contact system (OCS), communications, train control, operations, and maintenance facilities and elements as specified in this Scope of Work. Contractor shall include within these demonstrated provisions a layout plan and sections, inclusive of foundations, to validate the future installation of these systems per the requirements established in the Design Criteria and as communicated to the Contractor during the Interface Coordination and Design Integration Workshops. The 30'-0" nominal distance for future OCS pole foundations on aerial structures shall also apply to proposed retained fill sections. Further coordination shall take place during the Interface Coordination and Design Integration Workshops.
- Other information that establishes the baseline for the Project

Contractor shall prepare Design Baseline Report, submit for review, coordinate comment resolution, and ensure approval of the Design Baseline Report by Authority within 180 days of NTP. Authority's review period for the Design Baseline Report is twenty working days.

Drawings shall include dimensions that demonstrate the intent and boundaries of the design to be advanced into final design. Design assumptions for elements identified as future CHSTP facilities by others will be provided by the Authority for incorporation into the Design Baseline Report documents, and reviewed with Contractor during the Interface Coordination and Design Integration Workshops.

Upon receipt of approval, the Design Baseline Report will be subject to the Authority's configuration management and change control process.

4.9.2 Hydrology and Hydraulics Reports

Contractor shall prepare Hydrology and Hydraulics Reports to support the drainage design of the full build-out of CHSTP trackway as well as the temporary drainage system for the interim condition.

Contractor shall contact and coordinate with State and local jurisdictions to obtain necessary information for preparation of its reports.

4.9.3 Geotechnical Reports

The Contractor shall perform geotechnical investigations, perform analysis, and interpret all geotechnical data to finalize its design and prepare a Geotechnical Baseline Report-C (GBR-C), which shall replace the GBR-B. The GBR-C shall be submitted to and approved by the Authority prior to beginning of construction. Upon approval, the GBR-C and associated final design plans and specifications shall serve as the basis for design and construction of the Project elements. The Contractor may prepare and submit its GBR-C report(s) in a phased fashion in accordance with Contractor's design approach and construction means and methods. Authority's review period for the GBR-C is twenty working days.

Contractor shall also prepare a Geotechnical Data Report and Geotechnical Engineering Design Reports to support its design calculations and requirements for design and construction of the full build-out of trackway and trackwork, embankment, excavation, soundwalls, retaining walls, trenches, tunnel structures, grade separation, roadways, and all other facilities constructed by Contractor or to be constructed by others per the requirements of the Design Criteria as well as the requirements of State and local jurisdictions. These Geotechnical Reports shall include and address additional geotechnical explorations performed by the Contractor through its design and construction phases.

Contractor's Geotechnical Investigation Plan shall be submitted to the Authority prior to commencement of the field work, which shall be subject to V&V and self-certification as described in V&V and Self-Certification Requirements in Book 3. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements. If Contractor proposes to use investigation methods and/or frequencies that differ from the guidelines set forth in the Design Criteria, a variance for the proposed alternate investigation plan(s) shall be submitted to the Authority for approval prior to commencement of the field work. Contractor's attention is further directed to Section 4.14 of this Scope of Work concerning Design Variance Requests, as well as Sections 4.3, 4.9.4, and 5.9 for related design efforts.

Contractor shall contact and coordinate with State and local jurisdictions to obtain all necessary information for preparation of its reports.

4.9.4 Structures Reports

Contractor shall prepare Structures Reports providing the basis for the design of retaining walls, U-Walls, cut-and-cover boxes, jacked boxes, bridges, and aerial structures.

Contractor shall also prepare and submit a Type Selection Report for each HSR aerial structure (i.e. grade separations, bridges, and/or viaducts). The Type Selection Report(s) will be subject to Authority approval. Authority's review period for the Type Selection Report(s) is twenty working days. As part of the Type Selection Report(s), Contractor shall include the following reports:

- Type Selection Memo (Type Selection Memo shall be subject to approval as part of the Type Selection Report Submittal)
- Major Reports (Major Reports, as listed below, shall be subject to approval as part of the Type Selection Report Submittal)
    - Seismic Analysis and Design Plan (Design Criteria 11.3)
    - Rail Stress and Fastener Design and Analysis Plan (Design Criteria 12.6.8.6)
    - Complex and Non-Standard Aerial Structures Load Path Report (Design Criteria 12.8.7)
- Supporting Reports (Contractor shall have secured Authority concurrence on the applicable sections of the Supporting Reports listed below prior to inclusion in the Type Selection Report Submittal)
    - Hydrology and Hydraulics reports (Section 4.9.2)
    - Geotechnical Engineering Design Report (Section 4.9.3)
    - Aesthetic Design and Review for Non-Station Structures Report (Section 4.9.5)

Structures Reports not part of Type Selection will be considered as standard design Structures Reports. Upon review of these other Structures Reports, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

Structure Reports for other jurisdictional authorities such as Caltrans, cities, counties, and railroads shall comply with requirements of that jurisdiction. Contractor shall coordinate with these jurisdictional authorities and obtain their written approval prior to the design and construction of these structures. Contractor's attention is directed to Sections 4.10 and 4.12 of this Scope of Work.

4.9.5 Aesthetic Design and Review for Non-Station Structures Report

As the Project takes form, a consistent system-wide image for the California High Speed Train Project is expected through the introduction of common elements associated with selected bridges and overpasses. Curvilinear forms can be effective for the following reasons:

- Image: Recognizable, consistent bridge and overpass forms can contribute toward establishing an aesthetic image for the CHSTP.
- Structural Precedents: Curvilinear forms such as arches and trusses have been successfully implemented for medium-span high-speed rail bridges internationally.

- Materials: Either concrete or steel would be appropriate materials. Designers have the latitude to propose materials, details, connections, abutments, etc.

Interfaces between major bridges, overpasses, and adjacent aerial structures shall be carefully and systemically coordinated to ensure smooth and appropriate transitions in accordance with the aesthetic design guidance (Aesthetic Guidelines for Non-Station Structures included in Book 3 of the Contract Documents), as well as the aesthetics mitigation measures in the Final EIR/EIS and the Mitigation Monitoring and Reporting Program.

Contractor shall follow such aesthetic design guidance to implement aesthetic design and visual resource mitigations and enhancements to structures. The Aesthetic Design and Review for Non-Station Structures Report shall describe Contractor's approach to implementing the guidelines.

Structures and other elements included in CP1 for aesthetic design and review preliminarily include the items below (subject to confirmation by the Contractor in its coordination as required herein).

- Aerial structures – approximately 3.7 miles in length
- Bridges, such as the one spanning across the San Joaquin River
- Overpasses, such as the ones crossing Highway 99, approximately 315 feet in length, and Golden State Boulevard, approximately 420 feet in length
- Retaining walls
- Trenches
- Local street lighting
- Access control fence
- Intrusion protection barrier

4.9.6 Certifiable Elements and Hazards Log

Contractor shall update, expand, and submit in-progress submittals of the Certifiable Elements and Hazards Log on a quarterly basis through the Design and Construction phases of the Project. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3. Hazards associated with each certifiable element that can reasonably be expected to occur within Contractor's Scope of Work shall be identified by Contractor on the Certifiable Elements and Hazards Log as defined in the CHSTP Safety and Security Management Plan found in Book 3 of the Contract Documents.

4.9.7 Safety and Security Certification Package

Contractor shall compile and submit a Safety and Security Certification Package when all Certifiable Items Lists for a particular element or infrastructure component are completed for

applicable milestone payment. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3. The Safety and Security Certification Package shall consist of a signed Certificate of Conformance for the Project element, all completed Certifiable Items Lists, a completed Certifiable Elements and Hazards Log (see Section 4.9.6), and all supporting documentation such as hazard analysis, drawings, and design element descriptions.

4.9.8 Final Design Report

Contractor shall prepare and submit a Final Design Report that includes all changes and revisions made to the Design Baseline Report, including the portion of the Work within Caltrans' Scope of Work. This report shall be supported by all variances and design exceptions granted by the Authority or other third parties that support the changes to the Design Baseline Report. The Final Design Report shall represent a conformed configuration of the design. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3.

4.10 Preparing Construction Drawings and Construction Specifications for Third Party Facilities

Contractor shall be responsible for preparation of the complete design and certification that construction drawings, construction specifications, reports, and calculations meet the requirements of Authority, and Third Parties.

The Project includes modification of facilities owned by Third Parties, and construction in and around facilities owned by Third Parties as shown in Section 3.5.

Contractor shall identify the design and construction requirements and codes of affected Third Parties; and document the requirements and codes in the Design and Code Analysis Report. Contractor shall perform this assessment taking into account signed agreements, draft agreements, or agreement language in process, as provided by the Authority. If a Third Party prepares design for its facilities, Contractor shall be responsible for coordinating and reviewing such design to ensure conformance with Contractor's design and construction efforts per the Contract requirements.

Agreements and Permits are included in Book 3 of the Contract Documents.

For City of Fresno roadways, Contractor shall employ the design speeds noted in the Preliminary Design Plans included in Book 4. For County of Madera and Caltrans roadways, Contractor shall employ the design speeds established by the County and Caltrans, respectively. Contractor's attention is further directed to Section 5.3 of this Scope of Work.

4.11 CHSTP Design Submittals

Contractor shall provide Design Submittals to the Authority as specified in this Scope of Work, the CHSTP Design Criteria and other mandatory documents included in the Contract Documents.

Unless otherwise noted, for Design Submittals, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

Contractor shall include in the baseline schedule each Design Submittal and Authority review period, including breakdown by Construction Package Segment and/or structure.

Contractor shall include hard copies and an electronic file posted in accordance with the direction provided in the General Provisions and the CHSTP CADD Manual.

At minimum, submittals shall identify the following:

- Location including Construction Package Segment (CP1A, CP1B, CP1C)
- Preparer and date
- Checker and date
- Signed and sealed by Engineer of Record, in accordance with State regulation
- Issue date and revision number
- Main point of contact, phone number, and company contact details

Contractor shall provide the following submittals to the Authority:

- Design Reports
  - Design Baseline Report (subject to Authority approval as noted in Section 4.9.1)
  - Design and Code Analysis Report
  - Aesthetic Design and Review for Non-Station Structure Report (as part of Design Baseline Report)
  - Value Engineering Report
  - Hydrology and Hydraulics Reports
  - Geotechnical Reports
  - Structures Reports
  - Certifiable Elements and Hazards Log (quarterly, in-progress submittals)
  - Final Design Report
  - Safety and Security Certification Package

  - Other technical reports as delineated in the CHSTP Design Criteria and this Scope of Work

- Construction Drawings
  - Nominal 60 percent design, all sheets represented
  - Nominal 90 percent design, all sheets included

  Civil and Structure Construction Drawings may be submitted in segments or by structure and shall include identification of future facilities by others for reference as determined in the Interface Coordination and Design Integration Workshops. These include facilities for traction power, overhead contact system, communications, train controls, location of special trackwork, and CHSTP facilities by others, and shall be identified as "NIC".

- Construction Specifications
  - Nominal 60 percent: an outline of Construction Specifications shall be submitted
  - Nominal 90 percent: all applicable Construction Specifications shall be submitted
- Ready for Construction (RFC) Submittals (subject to Authority approval as noted in Section 4.13)
  - Electronic Submittal Files (certified as representing the designs in the Construction Packages). Drawing Submittals shall be in accordance with the CHSTP CADD and Plan Preparation Manuals. All other electronic design files shall be in PDF.
  - Engineering Calculations (certified as representing the designs in the Construction Packages)
- Survey Reports (signed and sealed) as defined in CHSTP Design Criteria and Standard Specifications.
- Revised Attachment 8, as edited and expanded by the Contractor. Attachment 8 – Technical Contract Submittal List of the Scope of Work indicates which submittals shall be submitted to the Authority for approval, Statement of No Objection (SONO), or information, as described therein. This list is intended to provide the Contractor with a summary of the Technical Contract Submittal requirements. Contractor shall use this list as the basis to prepare its list of submittal requirements per the Contract Documents.

4.12 Third Party Design Submittals

Contractor shall provide Third Party submittals to respective Third Party and a copy to the Authority unless otherwise noted. Contractor shall be responsible for determining and providing submittal quantities required by Third Parties.

Submittals shall identify the following information:

- Location including Construction Package Segment (CP1A, CP1B, CP1C)
- Preparer and date
- Checker and date
- Signed and sealed by Engineer of Record, in accordance with State regulation
- Issue date and revision number
- Main point of contact, phone number, and company contact details

Contractor shall include in the baseline schedule each Third Party submittal and review period. Contractor shall apply V&V and self-certification as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements.

Upon Third Party approval of Third Party Submittals, Contractor shall forward a copy of the approval to the Authority for information.

4.13 Ready for Construction (RFC) Submittals

Contractor shall provide Ready for Construction Submittals to the Authority and receive the Authority's approval prior to constructing any portion of the Project. Authority's review period for RFC submittals is twenty working days. Contractor's attention is directed to Sections 3.2 *Prerequisites for Start of Construction* and 61.2 *Effect of Oversight, Reviews, Tests, Acceptances and Approvals* of the General Provisions.

Submittals shall include hard copies and an electronic file posted in accordance with the direction provided in the General Provisions and the CHSTP CADD Manual.

Submittals shall identify the following information:

- Construction Package Segment (CP1A, CP1B, CP1C)
- Preparer and date
- Checker and date
- Engineer of Record (signed and sealed for Construction Packages)
- Issue date and revision number
- Main point of contact, phone number, and company contact details

Contractor shall provide the following submittals to the Authority:

- Construction Drawings
- Construction Specifications

- Engineering Calculations (certified as representing the designs in the Construction Packages)
- Electronic Submittal Files
- Testing and Acceptance Plans
- Safety and Security Certification Package
- Revised Attachment 8, as edited and expanded by the Contractor, to include construction-phase submittals.

Contractor shall include in its baseline schedule each Submittal, including breakdown by section or structure.

4.13.1 Ready for Construction Submittals Prior to Final Design

This sets forth the requirements under which certain portions or elements of the Project may be packaged by the Contractor to initiate construction for certain discrete portions or elements of the Project prior to final design. These requirements shall apply to any Work that is performed by the Contractor prior to completing the overall final design. All such Work is performed at the sole risk of the Contractor.

The Contractor, as the designer and builder of the Project, is the party at risk and shall be responsible for design errors, inconsistencies, omissions, and conflicts within the design which may cause the Work to be interrupted or changed during the course of construction.

The Contractor may at any time propose a procedure to initiate the start of construction prior to final design at Contractor's sole risk for selected structures or structural element(s) that are critical to the timely completion of the Project. This procedure shall be coordinated with and subject to Authority's concurrence.

If the final design documents for the Project require changes to the Work performed by the Contractor as described herein, the Contractor shall make such changes to the Work, including removal and replacement if necessary, at its sole cost and expense, and shall not be entitled to any extension of Completion Deadlines or adjustment in the Contract Price.

4.14 Design Variances

Design variances have been preliminarily approved for specific conditions and locations based on preliminary engineering studies, and are identified in the Preliminary Design Variance Report(s) included in Book 3 of the Contract Documents. Final approval of these Preliminary Design Variances will occur upon Contractor's Design Variance Request submittal(s) during final design, if still applicable.

Contractor shall review the Preliminary Design Variance Report and determine if design modifications can be incorporated into the Design Baseline Report to achieve the design criteria and not require a design variance. Regardless of previous approvals during preliminary

engineering studies, Contractor shall submit a request for each preliminary and/or new design variance needed to support design and construction. Contractor shall obtain final approval of Design Variances prior to incorporation of a design variance into a Construction Package. Design Variance Requests are subject to the Authority's change control process. Authority's review period for the Design Variance Request is twenty working days.

Contractor shall not assume that additional Design Variance Requests will be approved beyond those included in the Design Variance Report provided in Book 3 of the Contract Documents.

Contractor shall refer to the Authority's Design Variance Guidelines and CHSTP Design Criteria in Book 3 of the Contract Documents for definition on design variance process and criteria thresholds, respectively.

4.15 Construction Services

Contractor shall provide Construction Services including but not limited to those described below.

4.15.1 Safety and Security

Contractor shall be responsible for all work-site safety and security activities. Contractor shall prepare and submit a Site-Specific Health and Safety Plan and Site-Specific Security Plan as described in the CHSTP Safety and Security Management Plan in Book 3 of the Contract Documents. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

4.15.2 Hazardous Material Handling

Contractor shall remove and dispose of all Hazardous Material in accordance with the General Provisions.

4.15.3 Utility Work and Coordination with Utility Companies

Contractor shall be responsible for utility work as delineated in the General and Special Provisions. Coordination with utility companies shall be conducted as described in the CHSTP Design Criteria, agreements, and other requirements specified in the Special and General Provisions.

AT&T and PG&E will perform design and construction of their facilities.

4.15.4 Construction-Phase Submittals

Construction-phase submittals are defined as those submittals required under the Construction Specifications, such as shop drawings, product data, samples, installer qualification statements, manufacturer's instructions, and source and field quality control submittals.

Attachment 8 – Technical Contract Submittal List of the Scope of Work includes those construction-phase submittals specified in mandatory Standard Specifications. The Contractor shall also incorporate all submittals required under its Construction Specifications into the list

along with an indication whether those submittals shall be submitted to the Authority for SONO or information. The list itself shall be submitted to the Authority for SONO.

Contractor shall prepare construction-phase submittals, including shop drawings, in accordance with mandatory CHSTP Standard Specifications, or portions thereof, as noted in Attachment 5 of this Scope of Work and in accordance with Contractor's Construction Specifications.

Construction-phase submittals shall be subject to self-certification and concurrence by Independent Checking Engineer/Independent Site Engineer. As part of the Contractor's self-certification, the Contractor's engineer as defined in Standard Specifications Section 02 01 00, Standard Specifications General Statements, shall confirm that the design intent is being met and that submittal is in compliance with the Contract requirements. Contractor shall comply with Attachment 7 – Procedures for Construction-Phase Submittals.

4.15.5 As-Builts

Contractor shall prepare and submit as-built drawings, signed and sealed, in accordance with CHSTP CADD and Plan Preparation Manuals. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents. As-built drawings shall fully reflect the final, completed, as-built condition, inclusive of works completed by others in support of the Project and verified by the Contractor. As-built plans shall include Consolidated Service Drawings that fully address utility services designed and constructed by Contractor and/or others in support of the Project. Contractor shall survey the installed utilities to verify the actual placement.

Contractor shall prepare and submit as-built specifications, signed and sealed. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3. As-built specifications shall fully reflect the final, completed, as-built condition, inclusive of works completed by others in support of the Project and verified by the Contractor. Contractor shall submit electronic files of As-Built Specifications (with tracked changes) and original marked up as-built specifications (hard copies).

Contractor shall prepare and submit as-built construction-phase submittals. As-built construction-phase submittals shall fully reflect the final, completed, as-built condition. Changes from such submittals shall be documented in accordance with the processes required for construction-phase submittals, including Verification and Validation and Self-Certification.

4.15.6 Environmental Mitigations

As set forth in and subject to Section 7.7 of the General Provisions, Contractor shall be responsible for the review, coordination, permitting, design, construction, implementation, and monitoring of the conditions, avoidance, minimization and mitigation measures, project design features, and other environmental commitments contained in the Final Environmental Documents and Government Approvals. Contractor is expected to review the conditions, measures, features, and other commitments included in the Final Environmental Documents and Governmental Approvals, verify against the Scope of Work, and submit a list of all

mitigation related measures and features as part of the Environmental Management Plan (EMP) to allow the Authority to verify completeness and concurrence with the list.

Contractor's attention is further referred to other requirements as specified in the General/Special Provisions and the Mitigation Monitoring and Reporting Program in Book 3.

5 Project Work Elements

The following is a summary of major work elements of the Project. For a more comprehensive list of Work Elements refer to Attachment 3 "Scoping Typical Sections" and Attachment 4 "Scope Elements Matrix" of this Scope of Work.

5.1 Demolition, Clearing, and Grubbing of the Construction Site

The Contractor shall remove all existing structures and other improvements within the limits of the right-of-way, and the Contractor shall clear and grub the Site, inclusive of Third Party facilities and the relocation of waterways and utilities. If a structure is partly within the limits of the right-of-way and partly outside of the limits of the right-of-way, the Contractor shall remove the entire structure and its foundation.. Contractor shall prepare and submit a demolition plan to the Authority prior to its demolition activities, which shall be subject to V&V and self-certification as described in V&V and Self-Certification Requirements in Book 3. The Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements. For recycling requirements, refer to Sustainability Requirements in the General Provisions.

Removal, relocation, and/or purchase of existing billboards, inclusive of supporting structures (i.e. poles), will be completed by others through the ROW Appraisal/Acquisition process (not-in-scope for Contractor). Contractor shall remove any remaining billboard foundations.

Contractor shall remove the existing Belmont Avenue undercrossing, including trench walls and roadway. The existing UPRR bridge shall remain and be protected in place.

5.2 Railroad Relocation and Reconstruction

Draft and/or final design, construction, and maintenance agreement(s) with the railroads establish scope, roles, and responsibilities of the parties during each phase of Project development and construction. These include, but are not limited to work performed by the railroad, railroad's review and approval of Contractor's design, the railroad's review period, permitting, inspection, safety, insurance, and flagging requirements.

If the agreements with the railroads assign the scope of design and construction of railroad relocation to the Authority, the Contractor shall design and/or construct railroad relocation to accommodate the CHSTP per the requirements of the agreements. Contractor shall coordinate its railroad design and construction activities with railroads directly and comply with railroad requirements when working within or adjacent to railroad right-of-way.

If the railroads perform the design and/or construction of their relocation to accommodate the CHSTP, Contractor shall coordinate with the railroads directly to ensure railroad activities accommodate Contractor's Work and schedule. Contractor shall comply with railroad requirements when working within or adjacent to railroad right-of-way.

Contractor shall design and construct the UPRR shoo-fly required to accommodate the construction of the Tulare Street and Ventura Street crossings under the proposed HSR alignment within the CP1B Limits of Work.

Contractor shall design and construct the SJVRR spur tracks in the vicinity of Dry Creek Canal under the assumption that only one spur line may be closed at a time (i.e. one spur line shall remain open at all times).

5.3 Roadway Construction

Work within or affecting the State Highway System (SHS) or within the SHS right-of-way shall be coordinated with and performed per Caltrans requirements.

Work within or affecting local jurisdictions shall be coordinated with and performed per the requirements of the jurisdictional authorities.

For City of Fresno roadways, Contractor shall employ the design speeds noted in the Preliminary Design Plans included in Book 4. For County of Madera and Caltrans roadways, Contractor shall employ the design speeds established by the County and Caltrans, respectively.

Contractor shall design, construct, and maintain temporary access roads for its needs and those that may be required by local jurisdictions and emergency response authorities. Contractor shall also design, construct, and maintain permanent CHSR access roads required by the Project per the requirements of the CHSTP Design Criteria and Directive Drawings. Contractor shall coordinate with the Authority Representative and local jurisdictions for the location of permanent access roads. Permanent access roads are required as indicated in the CHSTP Design Criteria and shall coincide with the location of future CHSR wayside systems/operations facilities as shown on the Preliminary Design Plans. Additional permanent access roads may be required by emergency response authorities. Contractor shall coordinate the design of access roads through Interface Coordination and Design Integration Workshops with the Authority.

Lighting and landscaping of roadway facilities that are within Caltrans and other jurisdictional authorities shall be coordinated with and performed per the requirements of the jurisdictional authorities. Contractor shall refer to Mitigation Monitoring and Reporting Program (MMRP) in the final environmental documents for additional landscaping requirements.

Work in the vicinity of the existing Golden State Boulevard ramps will require coordination with the City of Fresno. The City of Fresno is responsible for the demolition of these ramp structures just north of SR-41.

5.4 Trackway

Final horizontal and vertical alignments for the trackway shall be designed by Contractor for the entire Project limits, including the portion of the Work within Caltrans Scope of Work and location of all special trackwork. The limits of track alignment shall extend beyond Contractor's construction limits to the nearest point of tangency in plan and profile to ensure consistency, interface, and integration requirements with future work and in full support of ultimate CHSR operations.

Contractor's design of the trackbed shall not preclude the eventual design and installation of either a ballasted or non-ballasted track section, unless local conditions warrant a more specific determination. In this case, Contractor shall submit its analysis and results to the Authority for review. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents. Specifically, at-grade sections and shorter aerial structures (less than 1,000FT) shall be designed to accommodate either track section, including the more stringent structural loading requirements. Contractor shall assume the eventual design and construction of a non-ballasted track section for longer aerial structures (greater than 1,000FT) and below-grade structure. Contractor shall account for the long-term settlement criteria of the constructed trackway in the design and shall monitor the settlement of the constructed trackway to ensure conformity with the most stringent CHSTP Design Criteria to accommodate either track section. Contractor shall coordinate and implement track section homogeneity as well as operations and maintenance considerations through the Interface Coordination and Design Integration workshops with the Authority.

Trackway shall include the cut and fill, temporary protective layer, and the surface and underground drainage, with the exception of the underdrain system along the trackbed. The installation of underdrain system along the trackbed will be performed by the follow-on contractor(s).

5.5 Retaining Walls

Contractor shall design and construct retaining walls necessary for the CHSTP trackway, State Highway System, and local roadways. Design and construction of retaining walls shall include the drainage system for the walls.

5.6 Concrete Barriers

Intrusion protection barriers shall be located, designed, and constructed by Contractor where required to protect the High-Speed Train Operating Infrastructure from intrusion by automotive vehicles and/or railroad locomotives and cars per CHSTP Design Criteria, railroad, and Caltrans requirements. Contractor shall reference Proposed Preliminary Design plans for intrusion protection barrier preliminary locations between High-Speed Train Operating Infrastructure and existing railroads, and confirm consistency with CHSTP Design Criteria. Final locations of intrusion protection barriers between High-Speed Train Operating

Infrastructure and existing railroads will be based on preliminary risk assessment and hazard analysis prepared by the Authority.

At locations where the CHSTP will be located adjacent to an existing railroad and/or highway facility and an intrusion protection barrier is required, said barrier shall be located as close as possible to the right-of-way line that delineates the bounds between both entities. The intrusion protection barrier shall be designed and constructed to ensure maintenance and constructability from within Authority's right-of-way.

Contractor shall design and construct intrusion protection barriers that are integral with the trench walls.

For concrete barriers on grade separated structures over CHSTP trackway, Contractor shall design the barriers to accommodate future protective screen with solid plate.

5.7 Cut Sections and Walls (Trench Structures)

In areas where CHSTP trackway alignment is below grade, Contractor shall design and construct cut or cut wall sections to accommodate CHSTP trackway. Trenches are defined as below grade structures with a concrete retaining structure on both sides. When the bottom of a trench is below the water table or flood plains, the retaining structures shall be joined by a common reinforced concrete foundation (known as U-Wall).

Other cut walls that can be used when the CHSTP trackway alignment is above the existing ground water table (or flood plains), including but not limited to soil nail walls, cantilever soldier-pile walls, slurry walls, secant pile/tangent pile walls, and ground anchored walls (other than nail walls), depending on local site conditions. Space for access/egress shall be designed and constructed within the depressed alignment sections at nominal 2,500-foot intervals. Staircases shall be designed by Contractor as future accommodation and will be installed by others. Future installation of staircases shall not be precluded by Contractor's design and/or construction.

Contractor shall design and construct the soundwalls along the Roeding Park in downtown Fresno.

5.8 Tunnels

In areas where CHSTP trackway alignment is sufficiently below final grade and/or the local conditions require third-party crossings over the depressed CHSTP trackway, Contractor may design and construct a short tunnel (or other tunnel type) to accommodate CHSTP trackway. Tunnels shall be waterproofed and be independent of temporary excavation support. CHSTP structures shall be designed and constructed independent of third-party facilities. Fire/Life/Safety codes (NFPA 130) and CHSTP Design Criteria requirements shall be followed.

5.9 Bridges/Aerial Structures

Contractor shall design and construct grade separated structures such as bridges, aerial structures, and grade separations that are required for the Project in accordance with CHSTP Design Criteria requirements.

Grade separated structures owned by Third Parties to be built as part of the CHSTP Project shall be designed and constructed in conformity with the requirements of said Third Parties. In the event of conflicting requirements between the CHSTP Design Criteria and other standards and codes of practice, the more stringent requirements shall take precedence. Grade separated structures that span high-speed train trackways and have the capability to influence operability of high-speed trains in the event of failure, shall be designed per provisions in the CHSTP Design Criteria.

Contractor shall design the CHSTP grade separated structures, including the parapet walls, to accommodate the future installation of soundwalls (by others).

Contractor shall make an independent interpretation of the geotechnical information from previous site investigations, and shall carry out such additional geotechnical and subsurface investigations and surveys as are necessary to design and construct the grade separated structures or other elements of the Project, in conformity with the Contract requirements.

The Authority will review the seismic analysis and design to ensure the successful application of said criteria, as specified in the CHSTP Design Criteria. This effort shall be coordinated through the Interface Coordination and Design Integration Workshops with the Authority. Contractor's attention is directed to Section 4.9.4 for related submittal requirements.

5.10 Drainage

Contractor is responsible for the design to accommodate the full build-out of CHSTP trackway and facilities. However, in lieu of constructing CHSTP trackbed underdrains (closed drainage system) and the drainage system inside the CHSTP trench or tunnel sections, Contractor shall design and construct a temporary drainage system for CHSTP trackbed and trench or tunnel sections to accommodate the drainage of these facilities until the follow-on Contractor installs the final drainage system. Contractor shall design and construct all other permanent drainage systems, such as drainage laterals, to ensure the successful drainage of the Project in the interim and final conditions, complete in place.

Contractor is responsible for the design and construction of permanent drainage systems for Third-Party facilities being impacted by the Project.

At locations where the CHSTP will be located adjacent to an existing railroad and/or highway facility, a separate drainage system shall be designed and constructed to capture the runoff from each facility independently. The drainage system for each entity (Authority or Third-Party) shall be located within its right-of-way. Contractor shall also reference intrusion protection barrier location requirements as noted elsewhere in this Scope of Work.

In addition to the requirements of the Construction General Permit, the Project is subject but not limited to FMFCD Ordinance 96-1, "Urban Storm Water Quality Management and Discharge Control". Compliance with Ordinance 96-1 requires that Contractor implement the measures included in the FMFCD's "Fresno-Clovis Storm Water Quality Management Program Construction Site Storm Water Quality Management Guidelines".

5.10.1 Reliability of the Drainage Subsystem

Each pump station site shall be dimensioned to accommodate a redundant set of pumps and control equipment in the full build-out condition.

5.11 Utilities

Contractor shall ensure that existing and planned future utilities are not in conflict with CHSTP, State, and local improvements. Contractor shall relocate and/or protect the existing utilities in accordance with the requirements specified in the Special and General Provisions, CHSTP Design Criteria, and the requirements of utility owners and local jurisdictions. Contractor shall coordinate with local jurisdictions and the utility owners throughout the Project and shall design and construct the relocation of utilities in conflict with the Project, including future CHSTP facilities to be designed and constructed by others (i.e., relocation of existing overhead utilities that will conflict with future design and installation of CHSTP overhead contact system). Contractor is responsible for protection of utilities to remain in place during and after the performance of the Work.

For utilities that cross Caltrans work limits for SR 99, Contractor shall be responsible for overall coordination with the utility companies and Caltrans to ensure relocated utilities do not conflict with the Work and relocations meet the Contract requirements. Contractor shall be responsible for all utility relocations up to the mutually agreed tie-in location, whether the tie-in location is exactly at the work limit, extends slightly past the work limit, or falls within its work limit.

AT&T and PG&E will perform design and construction of their facilities.

Agreements executed to date between the Authority and utility owners are included in Book 3 of the Contract Documents. Contractor shall support the Authority for utility relocation agreements that may need to be finalized and/or executed for the Project.

Contractor is responsible for providing temporary utilities required for the performance of its work.

5.12 Grounding and Bonding

Contractor is responsible for design, installation, and testing, which includes providing the testing procedures for acceptance of all grounding and bonding for the facilities it is constructing, and shall install provisions for grounding and bonding of facilities constructed by third party or future contractors, per the requirements of Attachment 3 "Scoping Typical

Sections," Attachment 4 "Scope Elements Matrix," CHSTP Design Criteria, and Directive Drawings.

5.13 Access Control

Contractor shall design, construct, and maintain permanent access control including fences, gates, walls, and doorways.

5.14 Low Voltage Systems, Underground and Undertrack Ductbank, and Manholes

Contractor shall refer to and coordinate between CHSTP Design Criteria, Preliminary Design Plans, and Directive Drawings to locate, design, and install underground and undertrack ductbanks and supporting manholes for future CHSTP Systems facilities along the Authority right-of-way, as delineated in Attachment 4 "Scope Elements Matrix" and shown on the Preliminary Engineering Plans. Final locations and designs for the underground and undertrack conduit ductbanks shall be coordinated with Contractor at the Interface Coordination and Design Integration Workshops with the Authority.

5.15 25 kV Traction Power Underground Ductbank and Manholes

Contractor shall refer to and coordinate between the CHSTP Design Criteria, Preliminary Design Plans, and Directive Drawings to locate, design, and install underground ductbanks and supporting manholes for future CHSTP Traction Power Facilities that are located away from the Authority right-of-way (e.g., when the relocated Golden State Boulevard separates the Authority right-of-way from a future Traction Power facility site). Final locations and designs for the underground conduit ductbanks will be coordinated with Contractor through the Interface Coordination and Design Integration Workshops with the Authority.

5.16 Temporary Lighting and Pumps

Contractor shall be responsible for design and installation of temporary lighting and pump facilities for the Project. Contractor shall leave the temporary lighting and pump facilities for trenches and tunnels in place after completion of the Contract.

5.17 Reliability, Availability and Maintainability (RAM)

5.17.1 General

The Contractor shall design, build, and document the Project to achieve the required reliability, availability, maintainability (RAM) and accessibility of the Work, so that no aspect of Work causes a failure or condition which can affect passenger service or make the Work unavailable during the hours of operation, and so that no aspect of the Work precludes the future operating railroad system from achieving the requirement of no service-affecting failures caused by the Work.

RAM shall be ensured through application of federal, state, and city codes and the best practices per the Design Criteria, Directive Drawings, other Contract Documents, and quality control and assurance processes.

Accessibility for inspection and maintenance activities of the Work shall be ensured per Design Criteria, Directive Drawings, other Contract Documents, and quality control and assurance processes.

Contractor shall prepare and submit the deliverables itemized below. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents.

- Contractor RAM Program Plan (CRMP).
- RAM Allocation Report
- Historical Product Maintainability Report (HPMR)
- Maintenance Manuals
- Reliability-Centered Maintenance Report (RCMR)
- Preventive Maintenance Analysis (PMA)
- Corrective Maintenance Analysis (CMA)
- Maintainability Demonstration (MD) Plan and Procedure (MDPP), and Maintainability Demonstration Test Report (MDTR)

Contractor shall refer to the RAM document in Book 3 of the Contract Documents for detailed requirements applicable to the RAM activities and deliverables.

5.17.2 Reliability

Reliability criteria for the Work include design life, and codes and standards to be applied. Reliability criteria include seismic design standards; flood level considerations; and maintainability features to achieve the required service life of the equipment and structures per the Design Criteria, directive drawings, other Contract Documents, and quality control and assurance processes.

5.17.3 Availability

Contractor shall design, build, and document the Project so that the availability of Work during the hours of operation of the railroad for the duration of its design life is 100%, and so that any planned unavailability of the Work for inspection and maintenance can be performed outside the hours of operation in one or more consecutive days. For the hours of operation of the CHST System and the available maintenance window during non-operating hours, refer to Book 3: Basis of Design.

This requirement excludes unavailability of the Work caused by natural disasters which cause climatic or seismic conditions in excess of the limits defined by the Contract Documents, or caused by the third parties.

The Contractor shall identify the influences on the availability of the Work and shall demonstrate that these influences have been mitigated.

5.17.4 Maintainability

The Contractor shall design and construct the Work to minimize preventive and corrective maintenance requirements. The Contractor shall ensure that all required maintenance can be performed during the maintenance window outside the operating hours of the CHST System.

The following additional maintainability requirements shall be ensured in the design and construction:

- Design Life and Maintainability – Components which have a shorter design/service life than the whole structure or system, for example, bridge bearings and expansion joints shall be replaceable or maintainable within the maintenance window of non-operating hours. The Contractor shall conduct all necessary analysis and submit reports per the RAM document in Book 3 of the Contract Documents, identifying all such elements which are part of the Work.
- Accessibility – Accessibility provisions include inspection points, hatches, doors, swing out racks, quick release covers and similar features aimed at providing rapid access to equipment and structural elements which requires routine maintenance inspection, cleaning or replacement (such as gratings and filters), without the need for special tools or equipment. Contractor shall ensure ease of access for inspection and for replacement of components.
    - Other accessibility requirements include physical access into confined spaces; access that does not require dismantling of components and structures; access that minimizes a need for isolation of the OCS; and maximizing access and repair activities that can be completed within the non-operating maintenance window, including set-up of equipment, scaffolding and lifting platforms needed for inspections and work, and final inspections and tests to allow the return of the works to operational status.
    - Special attention shall be given to minimizing the need to access the underside of bridges and viaducts above the tracks, given the proximity of the future high voltage OCS, including feeder and static wires and the supporting poles, portals, and headspans. Inspection access shall avoid to the maximum extent possible the need for special equipment, the isolation of OCS, and the occupation of the tracks themselves.
    - Access shall not require the removal and/or deconstruction of any part of the works in order to inspect bearings, expansion joints and other sensitive elements of the structures that require inspection as part of the regular preventive maintenance program.

- Necessity for isolation of the OCS and/or tracks for passenger and work train operations to perform maintenance activities shall be minimized.
- Visible fault indicators shall be provided to assist in the physical monitoring or repair of structural elements and equipment.
- Handling provisions shall be provided, including lifting lugs for removal/replacement of heavy items or assemblies, fork-lift compatibility, and lifting limitations for manual handling.

- Adjustment and Alignment – Provisions shall allow for adjustment or alignment of equipment without isolation or occupation of the future operating tracks.

The Contractor shall assure and demonstrate these requirements as per the Contractor's RAM Program Plan and Contractor's Maintainability Demonstration Plan and Procedures and demonstrate verification through the Contractor's Maintainability Demonstration Report as outlined in the RAM document in Book 3 of the Contract Documents.

5.18 Durability

Contractor shall prepare Design and Construction Specifications to meet the Design Life and Durability goals of various elements of the Project as stated in CHSTP Design Criteria. Contractor shall submit documentation indicating how design meets the requirements of the Design Life and Durability of various elements of the Work to the Authority Representative for concurrence. Upon review, the Authority will issue one of the three dispositions as described in V&V and Self-Certification Requirements in Book 3 of the Contract Documents. Documentation shall include analysis, engineering data or research, and test reports, as applicable. Documentation shall include citing which Construction Specifications requirements and which design details address specific Design Life and Durability issues. Documentation shall explain design and Construction Specifications provisions that address Design Life and Durability for typical elements in specific locations and those design and Construction Specifications provisions, which address Design Life and Durability.

As an example, the following aspects for concrete design are among those that shall be addressed to achieve the required service life:

- Design shall develop concrete mixes with cement contents, cement type and water/cement ratios that are compatible with achieving the required chemical resistance as well as producing a workable concrete.
- Admixtures that enhance the durability shall be used.
- Contractor shall identify methodology for assessing the characteristics of the environment, the properties of the concrete required to resist the environment, and the requirements for trials to demonstrate that the concrete being produced is of a suitable standard and has the necessary properties.

- Contractor shall assess the environment and determine what the appropriate value (or values) of permeability would be to achieve the service life.
- Contractor shall develop crack control criteria in accordance with the Design Criteria, AASHTO Bridges and ACI standards and guidelines.

6 Attachments

- Attachment 1 – Limits and Extents of Work Table
- Attachment 2 – Limits of Work Map
- Attachment 2a – Caltrans Limits of Work Plan
- Attachment 2b – Caltrans Scope of Work Map
- Attachment 2c – City of Fresno Scope of Work Map – Veterans Boulevard
- Attachment 3 – Scoping Typical Sections
- Attachment 4 – Scope Elements Matrix
- Attachment 5 – Mandatory Standard Specifications Listing
- Attachment 6 – Mandatory Special Specifications Listing
- Attachment 7 – Procedures for Construction-Phase Submittals
- Attachment 8 – Technical Contract Submittal List

California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

ATTACHMENT 1
LIMITS AND EXTENTS OF WORK TABLE

CONSTRUCTION PACKAGE 1
ATTACHMENT 1 - LIMITS AND EXTENTS OF WORK TABLE

SEGMENT		EIR/EIS Document	LIMITS		STATIONING		FT	Miles	TOTALS Miles
			Start	End	Start	End			
CP1A	Hybrid Alternative	Merced - Fresno	South of Avenue 17	North of Veterans Boulevard **(See Note 3)**	2065+00	2740+56	67,556	13	**15**
					Sta. equality *2740+56 = 1713+98*				
					1713+98	1801+62	8,764	2	
	"S" Alignment N. of Veterans Blvd to N. of Stanislaus St	Merced - Fresno	North of Veterans Boulevard **(See Note 3)**	West Clinton Avenue	*Sta. equality* *1801+62 = S 10535+00*				
					S 10535+00	S 10806+00	27,100	5	**8**
		Merced - Fresno	West Clinton Avenue	North of Stanislaus Street (at Turnout)	S 10806+00	S 10970+00	16,400	3	
CP1B	"S" Alignment N. of Stanislaus St to S. of Santa Clara St	(See Note 1)	North of Stanislaus Street (at Turnout)	South of Santa Clara Street (at Turnout) **(See Note 2)**	S 10970+00	S 11030+00	6,000	1	**1**
CP1C	"S" Alignment S. of Santa Clara St to S. of E. American Ave	Fresno - Bakersfield	South of Santa Clara Street (at Turnout) **(See Note 2)**	South of East American Avenue	S 11030+00	S 11300+00	27,000	5	**5**

Note : ***Approx. Total: 29***

1. Segment is addressed in both the Merced-Fresno and Fresno-Bakersfield EIR/EIS Documents.
2. The UPRR shoo-fly required to accommodate the construction of the Tulare Street and Ventura Street crossings under the proposed HSR alignment shall be included within the CP1B limits of work.
3. Refer to *Attachment 2c - City of Fresno Scope of Work Map* for Veterans Boulevard work to be completed by City of Fresno.

Caltrans Scope Limit SR99 Relocation and HST Alignment			
HST Stationing Limits		SR99 Stationing Limits	
HST Start	HST End	SR99 Start	SR99 End
S 10691+50	S 10825+60	"A" 92+20	"A" 237+30

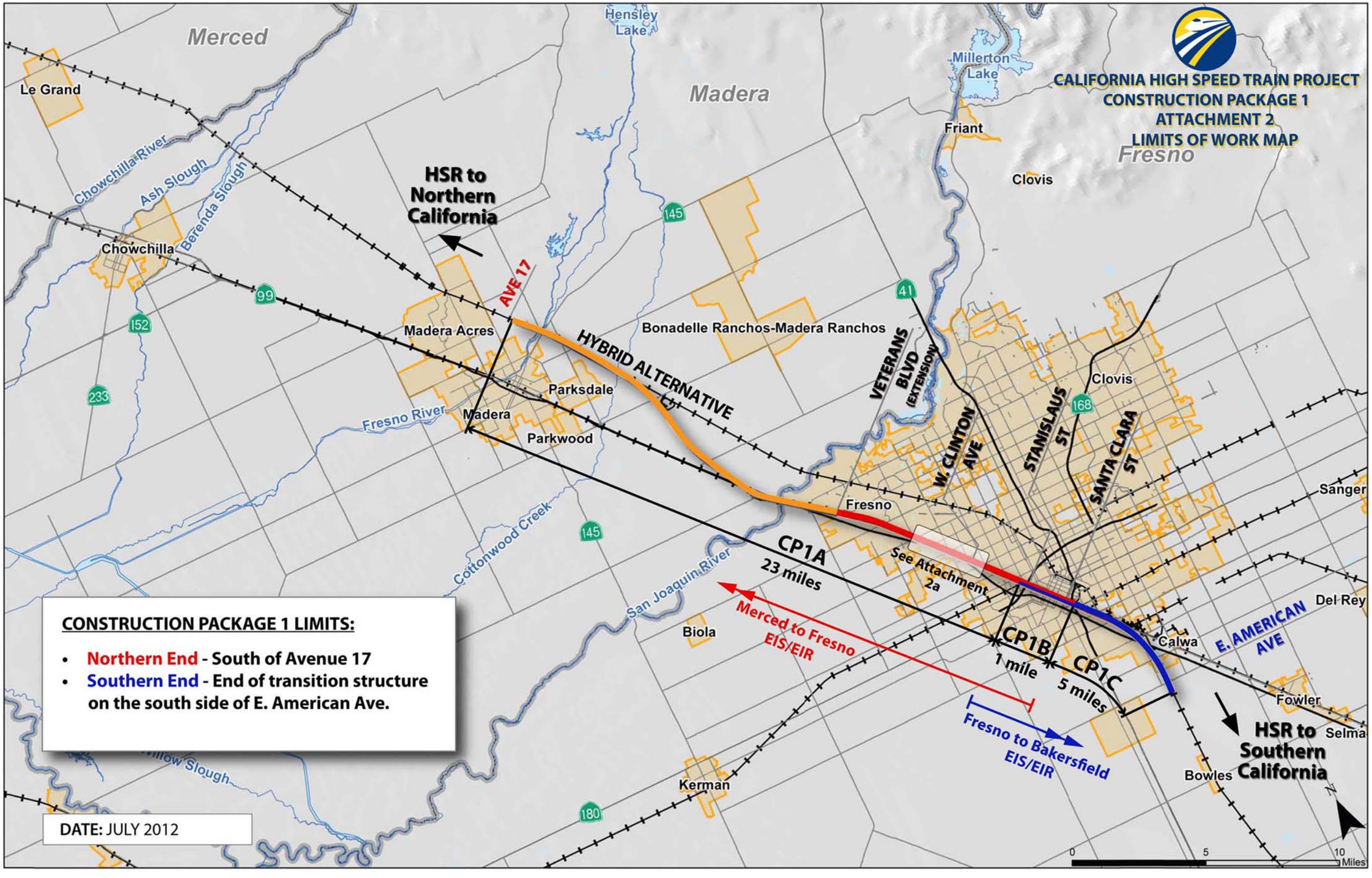
California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

ATTACHMENT 2
LIMITS OF WORK MAP

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTION PACKAGE 1
ATTACHMENT 2
LIMITS OF WORK MAP



CONSTRUCTION PACKAGE 1 LIMITS:

- **Northern End** - South of Avenue 17
- **Southern End** - End of transition structure on the south side of E. American Ave.

DATE: JULY 2012

HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

ATTACHMENT 2a
CALTRANS LIMITS OF WORK MAP

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTION PACKAGE 1
ATTACHMENT 2a
CALTRANS LIMITS OF WORK MAP
SR99 RELOCATION AND HST ALIGNMENT

HSR to Northern California

S10691+50
HST

"A" 237+30
SR 99

ASHLAN AVE

DAKOTA AVE

DAKOTA AVE

Fresno

SHIELDS AVE

WEBER AVE

UPRR

W. CLINTON AVE

S10825+60
HST

McKINLEY AVE

"A" 92+20
SR 99

HSR to Southern California

N

0 0.25 0.5 Miles

LEGEND

- City Limit Line
- UPRR
- HST Alignment
- HST Trackway within Caltrans SR99 Relocation Limits
- Caltrans SR99 Relocation
- On and Off Ramps and Local Roadways within Caltrans SR99 Relocation Limits

SEE ATTACHMENT 2b FOR CALTRANS SCOPE OF WORK MAP

DATE: JULY 2012

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California High-Speed Train Project

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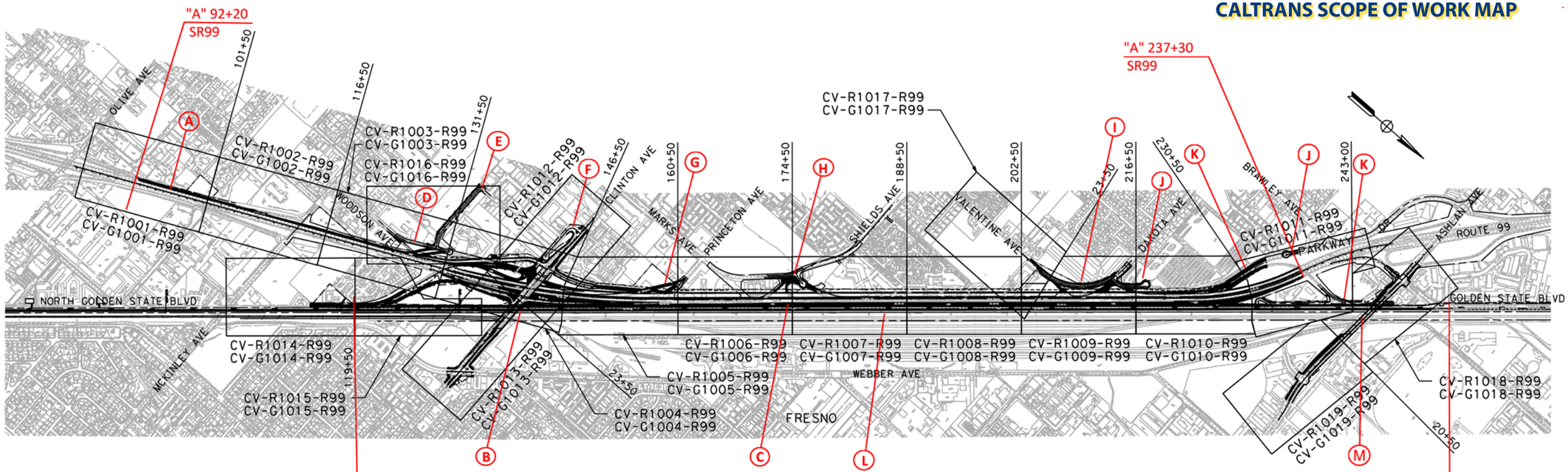
Scope of Work

ATTACHMENT 2b
CALTRANS SCOPE OF WORK MAP

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTION PACKAGE 1
ATTACHMENT 2b
CALTRANS SCOPE OF WORK MAP



Proposed Infrastructure to be performed by Caltrans includes, but not limited to, the following facilities:

A) SR99 SB Auxiliary Lane between McKinley Ave and Olive Ave
B) SR99 W. Clinton Ave Interchange
C) SR99 Mainline Relocation
D) N. Woodson Ave/N. Parkway Dr
E) N. Pleasant Ave
F) W. Vassar Ave
G) W. Princeton Ave
H) W. Shields Ave/N. Marks Ave
I) N. Valentine Ave / W. Dakota Ave
J) N. Parkway Dr
K) SR99 Ashlan SB On Ramp
L) High Speed Train Improvements (S10691+50 - S10825+60)
- CP01 Contractor shall establish HSR Alignment Plan and Profile
M) Ashlan Ave Interchange

DATE: JULY 2012

HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project

Agreement No.: HSR 13-06

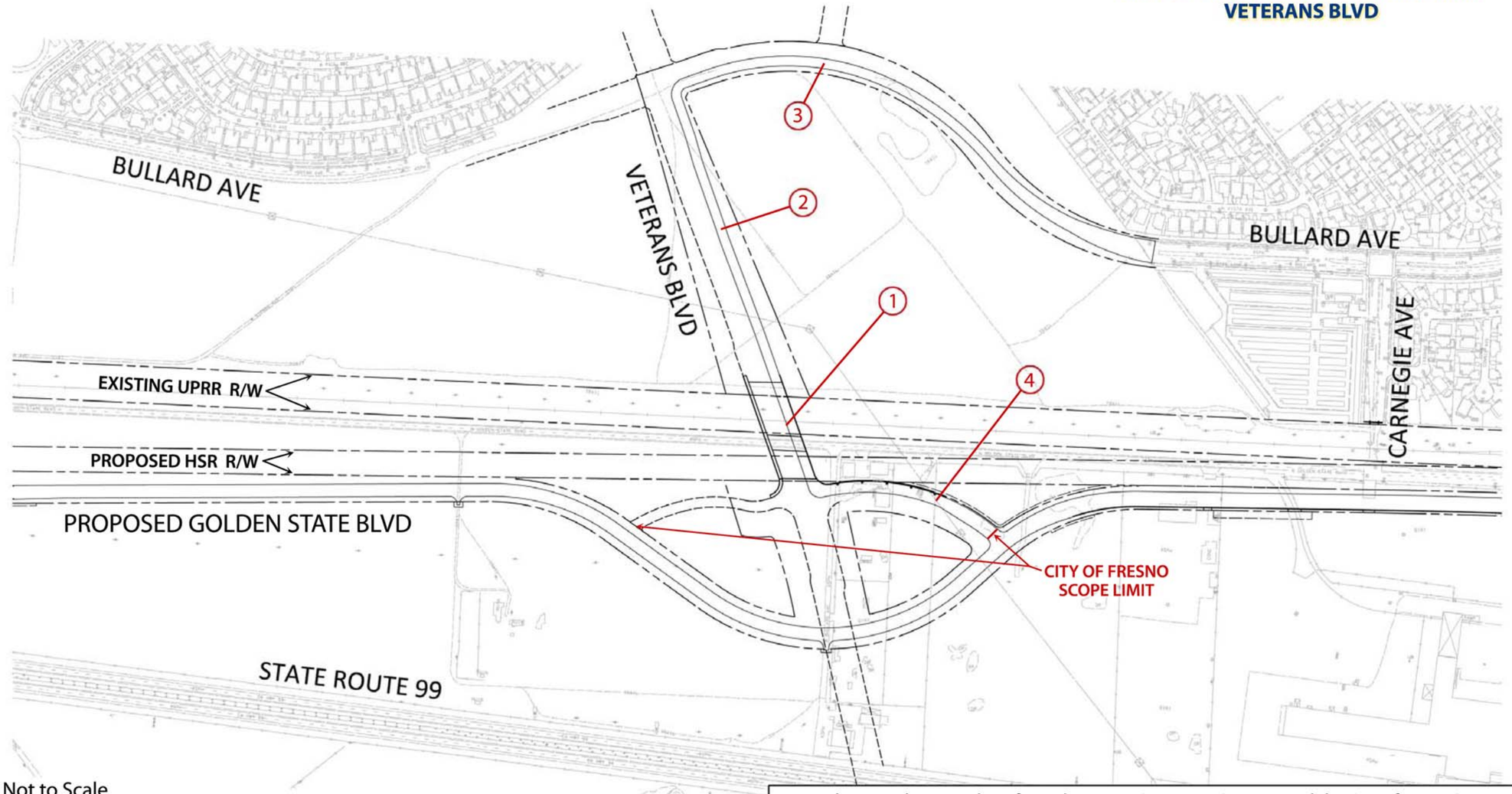
Scope of Work

ATTACHMENT 2c
CITY OF FRESNO SCOPE OF WORK MAP

Proposed Infrastructure to be completed by
City of Fresno includes the following:

1) Veterans Blvd. Overcrossing Structure
2) Veterans Blvd. Roadway Improvements
3) West Bullard Ave. Roadway Improvements
4) Veterans Blvd. Connectors (To Curb Returns at Golden State Blvd.)

CALIFORNIA HIGH SPEED TRAIN PROJECT
CONSTRUCTION PACKAGE 1
ATTACHMENT 2c
CITY OF FRESNO SCOPE OF WORK MAP
VETERANS BLVD



Not to Scale

DATE: DECEMBER 2012

Note: The exact limits and conforms between Contractor's scope and the City of Fresno's scope shall be confirmed during the Interface Coordination and Integration Workshops with the Authority. The Design and Construction of Golden State Blvd. shall remain in the Contractor's scope.

California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

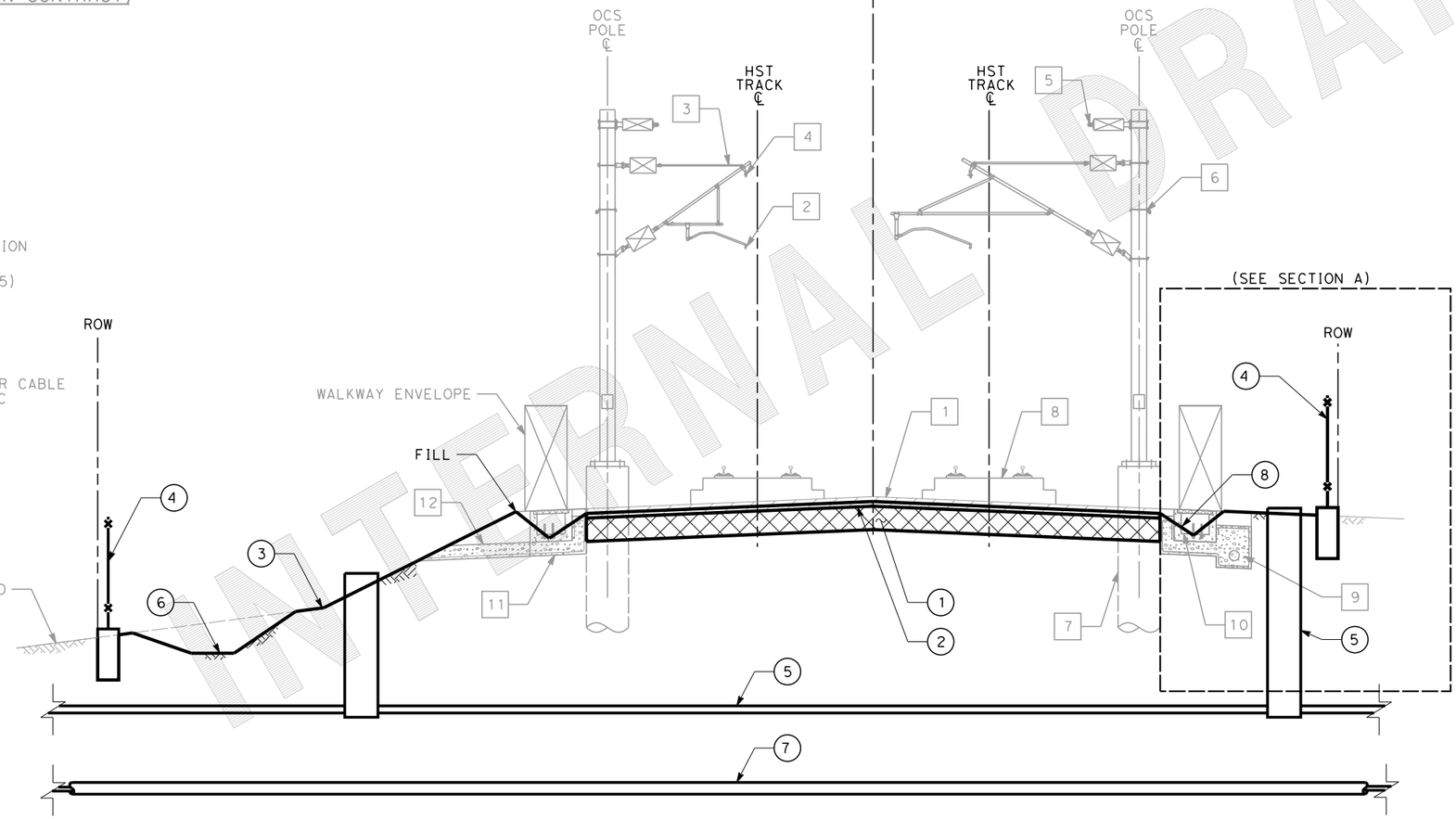
ATTACHMENT 3
SCOPING TYPICAL SECTIONS

WORK ELEMENTS (IN CONTRACT)

1. PREPARED SUBGRADE
2. PROTECTIVE LAYER (SEE NOTE 2)
3. FINISHED GRADE
4. FENCE AND FOUNDATION / INTRUSION BARRIER (SEE NOTE 3 & 4)
5. LOW VOLTAGE UNDER TRACK AND UNDER GROUND CONDUITS IN DUCTBANK AND MANHOLES
6. DRAINAGE DITCH
7. UTILITY CROSSINGS
8. TEMPORARY SURFACE DRAINAGE
9. 25KV UNDER GROUND CONDUITS IN DUCTBANK AND MANHOLES

WORK ELEMENTS (NOT IN CONTRACT)

1. SUBBALLAST
2. CONTACT WIRE
3. OCS ASSEMBLY
4. MESSENGER WIRE
5. NEGATIVE FEEDER WIRE
6. STATIC WIRE
7. OCS POLE AND FOUNDATION
8. TRACKFORM (SEE NOTE 5)
9. UNDERDRAIN
10. CABLE TROUGH
11. DRAIN AGGREGATE UNDER CABLE TROUGH WITH GEOFABRIC
12. INTERMITTENT DRAIN AGGREGATE LAYER
13. MAIN GANTRY



TYPICAL AT-GRADE SECTION

DATE: 11/02/2012

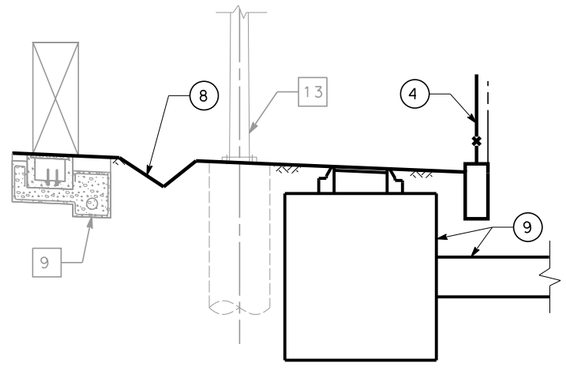
NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. PROTECTIVE LAYER TO PROTECT PREPARED SUBGRADE.
3. INTRUSION BARRIER (AS REQUIRED) ADJACENT TO ROADWAYS AND RAILWAY.
4. FENCE GROUNDING SHALL BE PROVIDED.
5. NON-BALLASTED TRACKFORM SHOWN FOR ILLUSTRATION PURPOSES ONLY. SEE SCOPE OF WORK.
6. SEE SCOPE OF WORK - SCOPE ELEMENTS MATRIX FOR PRELIMINARY LOCATIONS AND DETAILS FOR 25KV UNDERGROUND CONDUITS IN DUCTBANK AND MANHOLES.

LEGEND:

(#) IN CONTRACT

NOT IN CONTRACT



SECTION A
25KV DUCTBANK AND MANHOLES
(SEE NOTE 6)

THESE DRAWINGS ARE SOLELY FOR THE PURPOSE OF SCOPED WORK ELEMENTS AND ARE NOT INTENDED AS A DESIGN DIRECTIVE. TRACK, SYSTEMS, AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN. ACCORDINGLY THE INFORMATION CONTAINED HEREIN SHALL NOT BE USED FOR DESIGN AND\OR CONSTRUCTION PURPOSES. OTHERWISE, REFER TO SCOPE OF WORK AND TECHNICAL DIRECTIVES.

HSR 13-06 - EXECUTION VERSION

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS
AT-GRADE
OPEN AND CLOSED DRAINAGE SECTION
SOW-CP01-001

WORK ELEMENTS (IN CONTRACT)

1. PREPARED SUBGRADE
2. PROTECTIVE LAYER (SEE NOTE 2)
3. FINISHED GRADE
4. FENCE AND FOUNDATION / INTRUSION BARRIER (SEE NOTE 3 & 4)
5. UNDER TRACK CONDUITS IN DUCTBANK AND MANHOLES
6. DRAINAGE DITCH
7. UTILITY CROSSINGS
8. TEMPORARY SURFACE DRAINAGE

WORK ELEMENTS (NOT IN CONTRACT)

1. SUBBALLAST
2. CONTACT WIRE
3. OCS ASSEMBLY
4. MESSENGER WIRE
5. NEGATIVE FEEDER WIRE
6. STATIC WIRE
7. OCS POLE AND FOUNDATION
8. TRACKFORM
9. UNDERDRAIN
10. CABLE TROUGH
11. DRAIN AGGREGATE UNDER CABLE TROUGH WITH GEOFABRIC
12. INTERMITTENT DRAIN AGGREGATE LAYER

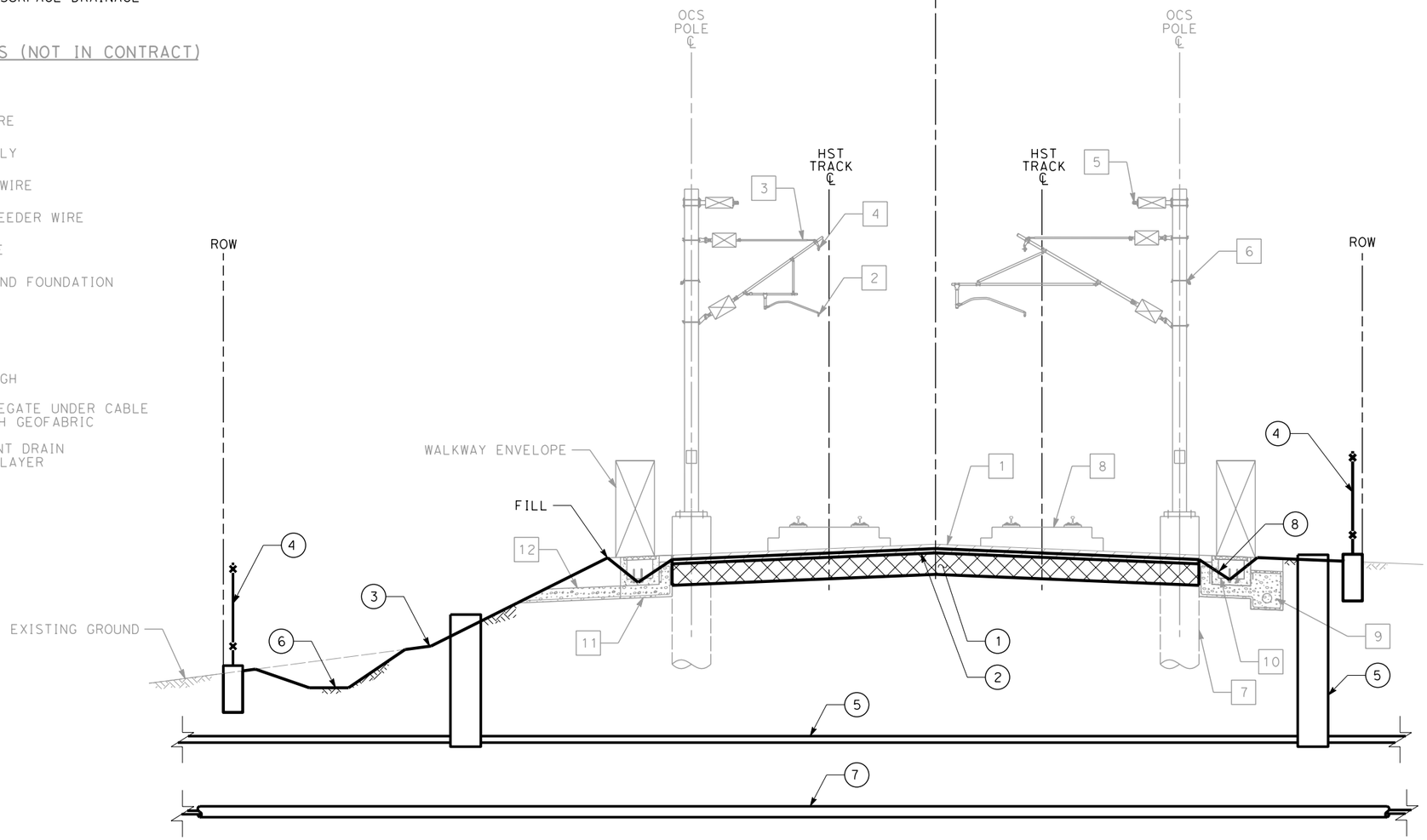
NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. PROTECTIVE LAYER TO PROTECT PREPARED SUBGRADE.
3. INTRUSION BARRIER (AS REQUIRED) ADJACENT TO ROADWAYS AND RAILWAY.
4. FENCE GROUNDING SHALL BE PROVIDED.

LEGEND:

(#) —— IN CONTRACT

[#] —— NOT IN CONTRACT



TYPICAL AT-GRADE SECTION

THESE DRAWINGS ARE SOLELY FOR THE PURPOSE OF SCOPED WORK ELEMENTS AND ARE NOT INTENDED AS A DESIGN DIRECTIVE. ACCORDINGLY THE INFORMATION CONTAINED HEREIN SHALL NOT BE USED FOR DESIGN AND\OR CONSTRUCTION PURPOSES. OTHERWISE, REFER TO SCOPE OF WORK AND TECHNICAL DIRECTIVES.

DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS
AT-GRADE
OPEN AND CLOSED DRAINAGE SECTION
SOW-CP01-001

HSR 13-06 - EXECUTION VERSION

WORK ELEMENTS (IN CONTRACT)

1. PREPARED SUBGRADE
2. PROTECTIVE LAYER (SEE NOTE 3)
3. FINISHED GRADE
4. FENCE AND FOUNDATION / INTRUSION BARRIER (SEE NOTE 4 & 5)
5. FALL PROTECTION
6. GUTTER
7. UNDER TRACK CONDUITS IN DUCTBANK AND MANHOLES
8. DRAINAGE DITCH
9. CONTINUOUS DRAINAGE BLANKET
10. RETAINING STRUCTURE
11. WEEP HOLE
12. RETAINING WALL PERFORATED PIPE UNDERDRAIN
13. UTILITY CROSSINGS
14. TEMPORARY SURFACE DRAINAGE

WORK ELEMENTS (NOT IN CONTRACT)

1. SUBBALLAST
2. CONTACT WIRE
3. OCS ASSEMBLY
4. MESSENGER WIRE
5. NEGATIVE FEEDER WIRE
6. STATIC WIRE
7. OCS POLE AND FOUNDATION
8. TRACKFORM
9. UNDERDRAIN (SEE NOTE 2)
10. CABLE TROUGH
11. DRAIN AGGREGATE UNDER CABLE TROUGH WITH GEOFABRIC.

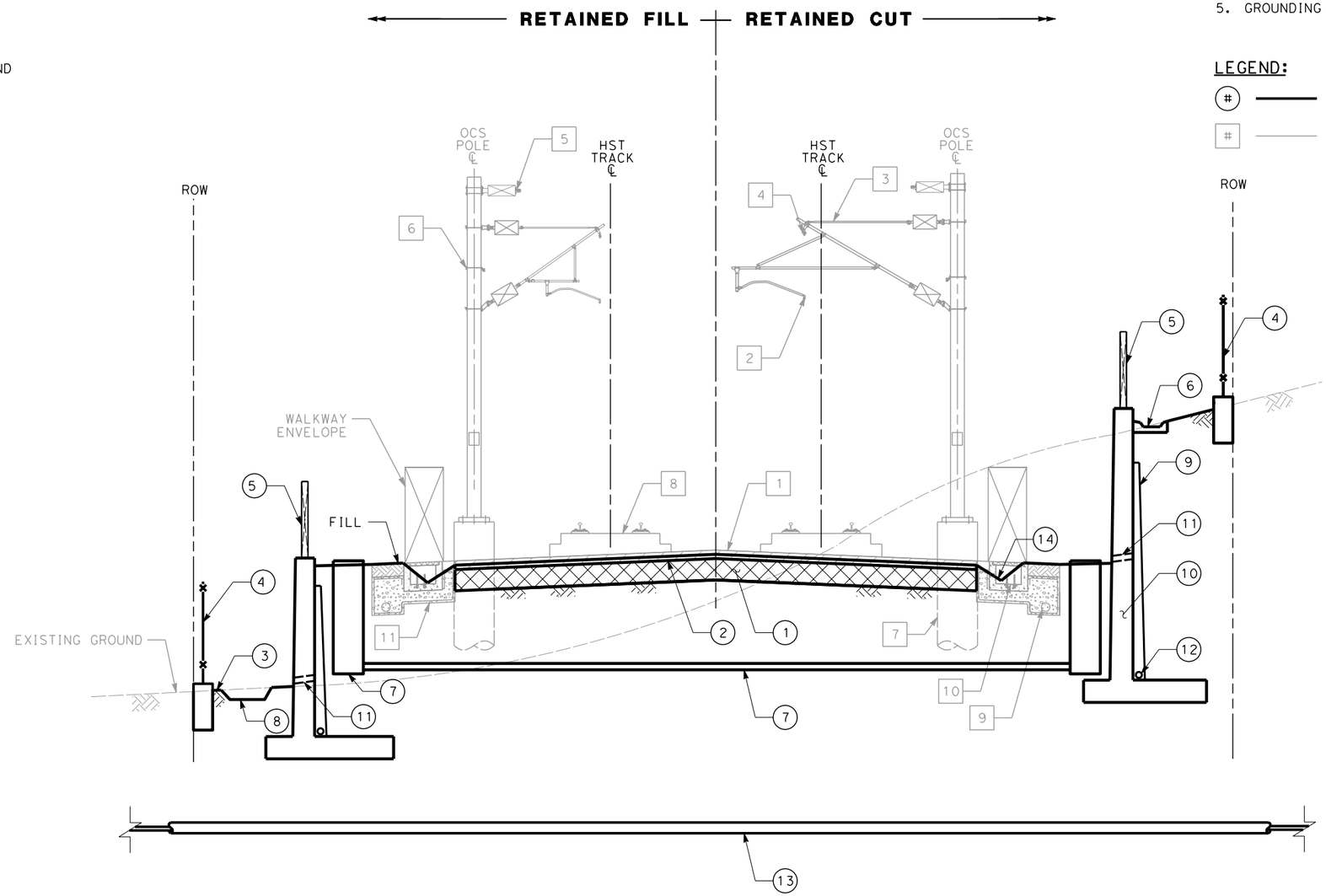
NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. TEMPORARY DRAINAGE SHALL BE PROVIDED.
3. PROTECTIVE LAYER TO PROTECT PREPARED SUBGRADE.
4. INTRUSION BARRIER (AS REQUIRED) ADJACENT TO ROADWAYS AND RAILWAY.
5. GROUNDING AND BONDING SHALL BE PROVIDED.

LEGEND:

(#) —— IN CONTRACT

[#] —— NOT IN CONTRACT



TYPICAL RETAINED CUT AND FILL SECTION

THESE DRAWINGS ARE SOLELY FOR THE PURPOSE OF SCOPED WORK ELEMENTS AND ARE NOT INTENDED AS A DESIGN DIRECTIVE. ACCORDINGLY THE INFORMATION CONTAINED HEREIN SHALL NOT BE USED FOR DESIGN AND\OR CONSTRUCTION PURPOSES. OTHERWISE, REFER TO SCOPE OF WORK AND TECHNICAL DIRECTIVES.

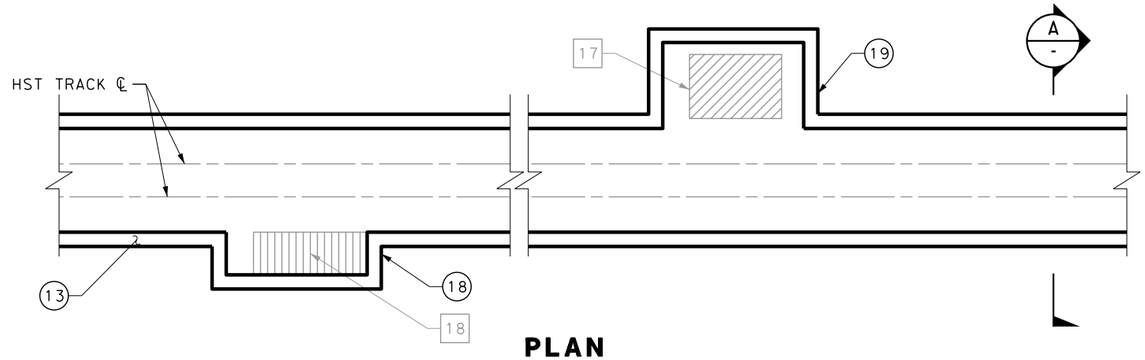
DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

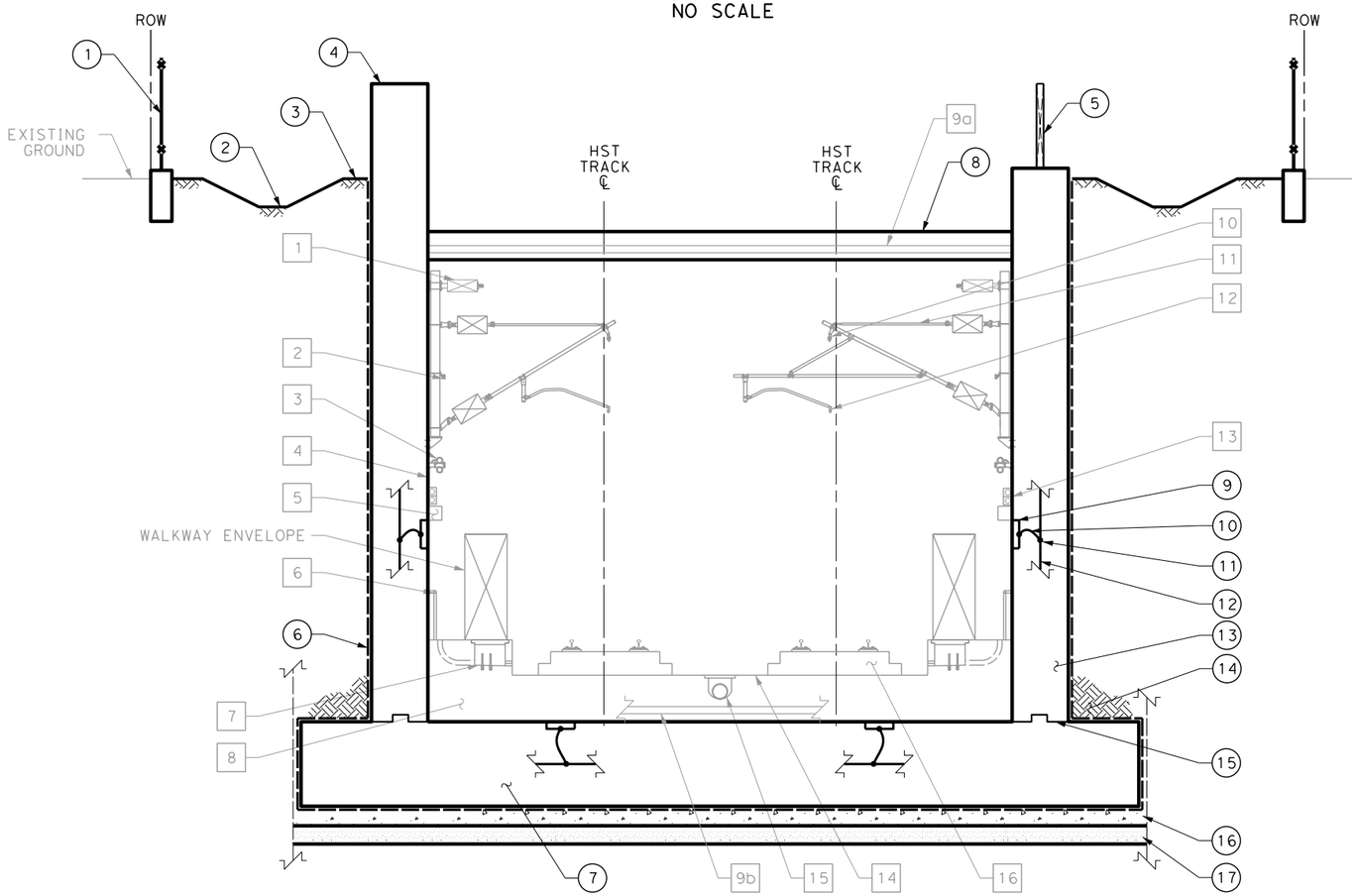
PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS
RETAINED CUT AND FILL
WITH CLOSED DRAINAGE
SOW-CP01-002

HSR 13-06 - EXECUTION VERSION



PLAN
NO SCALE



SECTION A -
NO SCALE

TYPICAL TRENCH SECTION

WORK ELEMENTS (IN CONTRACT)

1. FENCE AND FOUNDATION (SEE NOTES 3)
2. DRAINAGE DITCH
3. FINISHED GRADE
4. FLOOD / INTRUSION PROTECTION (AS REQUIRED) (SEE NOTE 4)
5. FALL PROTECTION
6. FULL PERIMETER WATER PROOFING
7. CONCRETE BASE SLAB
8. PERMANENT STRUT (IF REQUIRED)
9. THICK COPPPER GROUNDING PLATE (SEE NOTE 3)
10. GROUND JUMPER CONDUCTOR (SEE NOTE 3)
11. EXOTHERMIC WELD (SEE NOTE 3)
12. CONNECTING REBAR (SEE NOTE 3)
13. INTEGRAL CONCRETE WALL
14. COMPACTED BACKFILL / STRUCTURAL FILL
15. CONSTRUCTION JOINT WITH SHEAR KEY AND WATER STOP
16. CONCRETE MUD MAT
17. CRUSHED STONE
18. NICHE FOR STAIRWAYS
19. NICHE FOR SUMP PUMP (SEE NOTE 2)

NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR ADDITIONAL REQUIREMENTS AND DIMENSIONS.
2. TEMPORARY DRAINAGE FOR TRENCH SECTION SHALL BE PROVIDED. NICHE TO BE DESIGNED PER FINAL, ULTIMATE CONDITION
3. GROUNDING AND BONDING SHALL BE PROVIDED.
4. INTRUSION BARRIER (AS REQUIRED) ADJACENT TO ROADWAYS AND RAILWAY.

LEGEND:

(#) —— IN CONTRACT

[#] —— NOT IN CONTRACT

WORK ELEMENTS (NOT IN CONTRACT)

[1] NEGATIVE FEEDER WIRE
[2] STATIC WIRE
[3] TRACKSIDE RADIO COMMUNICATIONS CABLES
[4] RADIO COMMUNICATION CABLES TO TRACKSIDE RADIO EQUIPMENT
[5] LIGHT FIXTURES
[6] WALKWAY HANDRAIL
[7] CABLE TROUGH
[8] INVERT AND WALKWAY CONCRETE
[9a] ABOVE TRACK CONDUITS (ALTERNATIVE)
[9b] UNDER TRACK CONDUITS (ALTERNATIVE)

WORK ELEMENTS (NOT IN CONTRACT) CONT.

[10] MESSENGER WIRE
[11] OCS ASSEMBLY
[12] CONTACT WIRE
[13] CONDUITS, BOXES AND CONDUCTORS FOR LIGHTS
[14] INVERT
[15] DRAIN AND INLET (SEE NOTE 2)
[16] TRACKFORM
[17] SUMP PUMP (SEE NOTE 2)
[18] STAIRWAYS

THESE DRAWINGS ARE SOLELY FOR THE PURPOSE OF SCOPED WORK ELEMENTS AND ARE NOT INTENDED AS A DESIGN DIRECTIVE. ACCORDINGLY THE INFORMATION CONTAINED HEREIN SHALL NOT BE USED FOR DESIGN AND\OR CONSTRUCTION PURPOSES.

DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS

TRENCH
SOW-CP01-003

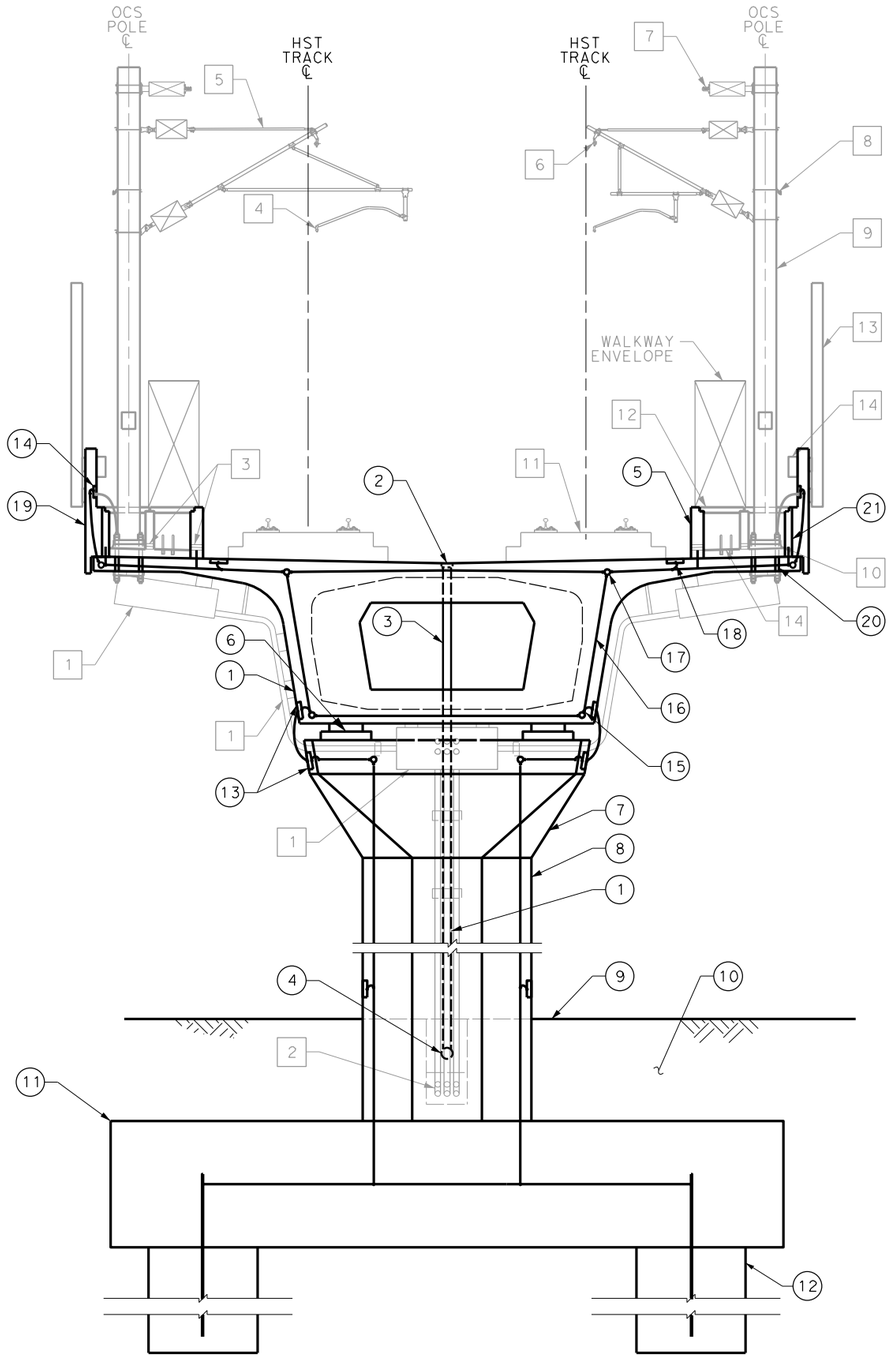
HSR 13-06 - EXECUTION VERSION

WORK ELEMENTS (IN CONTRACT)

1. BOX GIRDER
2. DRAIN AND INLET
3. DOWNSPOUT
4. DOWNSPOUT CONNECTION TO STORM DRAIN
5. DERAILMENT PROTECTION WALL
6. BEARINGS
7. PIER CAP
8. PIER
9. FINISHED GRADE
10. COMPACTED BACKFILL / STRUCTURAL FILL
11. FOOTING/PILE CAP
12. PILE/DRILLED SHAFT
13. THICK COPPER GROUNDING PLATE (SEE NOTE 4)
14. THICK COPPER GROUND BUS (SEE NOTE 4)
15. EXOTHERMIC WELD (SEE NOTE 4)
16. CONNECTING BONDING REBAR (SEE NOTE 4)
17. LONGITUDINAL BONDING REBAR (SEE NOTE 4)
18. GROUND JUMPER CONDUCTOR (SEE NOTE 4)
19. CONCRETE PARAPET
20. SLEEVES AT OVERHANG FOR OCS POLE FOUNDATION
21. CABLE TROUGH WALL

WORK ELEMENTS (NOT IN CONTRACT)

1. EXPOSED CONDUITS, SURFACE MOUNTED PULL BOXES, AND MOUNTING HARDWARE
2. CONDUITS CONTINUED TO SITE LIMITS OF JOB SITE AND/OR ADJACENT CORE SYSTEMS TRACKSIDE FACILITY (SEE NOTE 3)
3. SLEEVES FOR DRAINAGE OR CONDUITS
4. CONTACT WIRE
5. OCS ASSEMBLY
6. MESSENGER WIRE
7. NEGATIVE FEEDER WIRE
8. STATIC WIRE
9. OCS POLE
10. OCS POLE FOUNDATION
11. TRACKFORM
12. PRECAST COVERS
13. SOUND WALL (AS REQUIRED)
14. CABLE TROUGH (TYP)



TYPICAL AERIAL STRUCTURE SECTION

NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. DOWELS FOR FUTURE CABLE THROUGH SHALL PROVIDE THE CONTINUITY FOR THE GROUNDING SYSTEM.
3. WHERE THE CORE SYSTEMS TRACKSIDE FACILITY IS WITHIN THE AUTHORITY ROW, THE CIVIL CONTRACTOR SHALL EXTEND THE UNDERGROUND DUCT BANK TO THE FACILITY'S SITE LIMITS. IN THE CASE WHERE THE FACILITIES ARE LOCATED A DISTANCE FROM THE AUTHORITY ROW, THE CIVIL CONTRACTOR SHALL EXTEND TO THE UNDERGROUND DUCT BANK TO THE JOB SITE LIMITS.
4. GROUNDING AND BONDING SHALL BE PROVIDED.
5. FENCE SHALL BE PROVIDED ALONG THE AUTHORITY ROW (NOT SHOWN).

LEGEND:

(#) —— IN CONTRACT

[#] —— NOT IN CONTRACT

THESE DRAWINGS ARE SOLELY FOR THE PURPOSE OF SCOPED WORK ELEMENTS AND ARE NOT INTENDED AS A DESIGN DIRECTIVE. ACCORDINGLY THE INFORMATION CONTAINED HEREIN SHALL NOT BE USED FOR DESIGN AND\OR CONSTRUCTION PURPOSES. OTHERWISE, REFER TO SCOPE OF WORK AND TECHNICAL DOCUMENTS.

DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS

AERIAL STRUCTURE
SOW-CP01-004

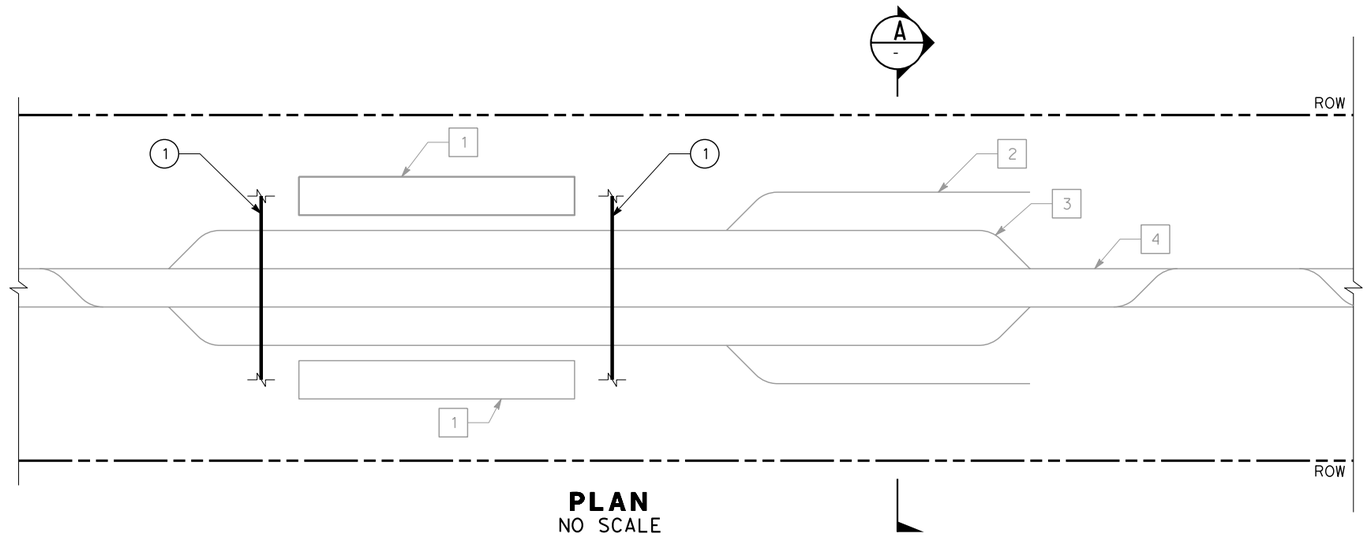
HSR 13-06 - EXECUTION VERSION

WORK ELEMENTS (IN CONTRACT)

1. UNDER TRACK CONDUITS IN DUCTBANK AND MANHOLES (SEE NOTE 4)
2. FENCE AND FOUNDATION / INTRUSION BARRIER (SEE NOTE 5 AND 6)
3. FINISHED GRADE
4. DRAINAGE DITCH
5. PREPARED SUBGRADE
6. PROTECTIVE LAYER (SEE NOTE 2)
7. UTILITY CROSSINGS
8. TEMPORARY SURFACE DRAINAGE

WORK ELEMENTS (NOT IN CONTRACT)

1. STATION PLATFORM
2. REFUGE/STORAGE TRACK (TYP)
3. PLATFORM TRACK (TYP)
4. MAIN TRACK (TYP)
5. INTERMITTENT DRAIN AGGREGATE LAYER
6. SUBBALLAST
7. DRAIN AGGREGATE UNDER CABLE TROUGH WITH GEOFABRIC
8. NEGATIVE FEEDER WIRE
9. STATIC WIRE
10. CONTACT WIRE
11. MESSENGER WIRE
12. OCS ASSEMBLY
13. OCS POLE AND FOUNDATION
14. TRACKFORM
15. UNDERDRAIN (TYP)
16. CABLE TROUGH



PLAN
NO SCALE

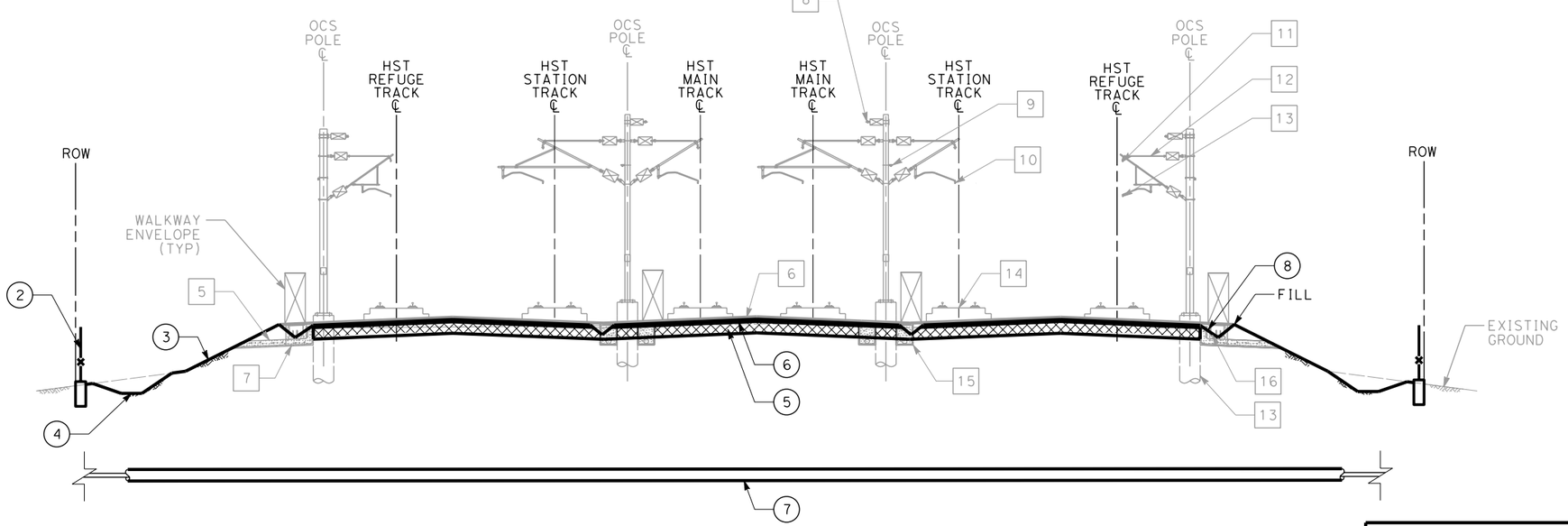
NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. PROTECTIVE LAYER TO PROTECT SUBGRADE FOR FUTURE MAIN TRACKS, PLATFORM TRACKS, AND REFUGE/STORAGE TRACKS.
3. UNDER TRACK CONDUITS LOCATED TRANSVERSE TO TRACKS AT THE ENDS OF THE PLATFORMS IN DUCTBANK AND TERMINATED IN MANHOLES.
4. INTRUSION BARRIER (AS REQUIRED) ADJACENT TO ROADWAYS AND RAILWAYS
5. FENCE GROUNDING SHALL BE PROVIDED.

LEGEND:

(#) —— IN CONTRACT

[#] —— NOT IN CONTRACT



SECTION A -
NO SCALE

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DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS
SIX TRACK AT-GRADE
STATION APPROACH
SOW-CP01-005

HSR 13-06 - EXECUTION VERSION

WORK ELEMENTS (IN CONTRACT)

(1) PREPARED SUBGRADE

(2) PROTECTIVE LAYER (SEE NOTE 3)

(3) UTILITY CROSSINGS

(4) TEMPORARY SURFACE DRAINAGE

WORK ELEMENTS (NOT IN CONTRACT)

[1] SUBBALLAST

[2] CONTACT WIRE

[3] OCS ASSEMBLY

[4] MESSENGER WIRE

[5] NEGATIVE FEEDER WIRE

[6] STATIC WIRE

[7] OCS POLE AND FOUNDATION

[8] TRACKFORM

[9] UNDERDRAIN (SEE NOTE 2)

[10] CABLE TROUGH

[11] STATION PLATFORM

[12] SCREEN WALL

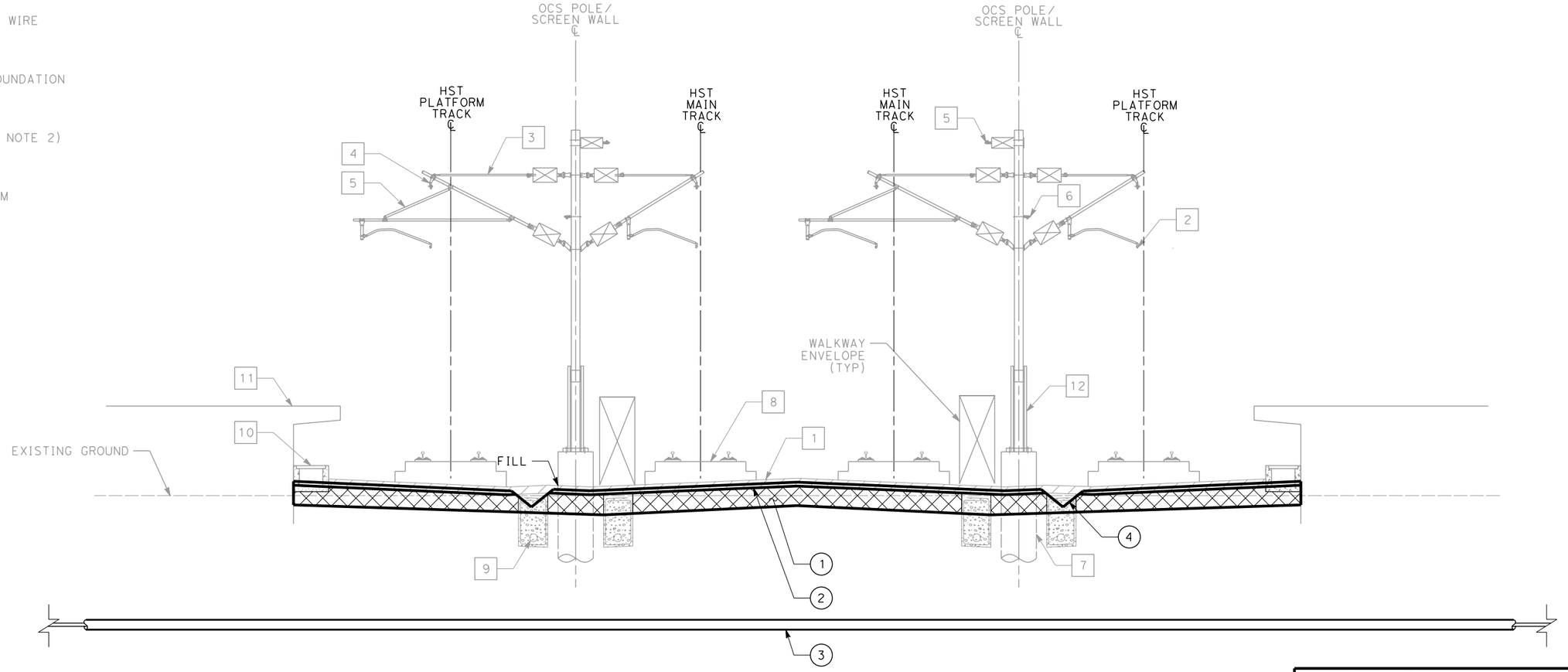
NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. TEMPORARY DRAINAGE SHALL BE PROVIDED.
3. PROTECTIVE LAYER TO PROTECT PREPARED SUBGRADE.
4. FENCING SHALL BE PROVIDED ALONG RIGHT-OF-WAY1 LIMITS (NOT SHOWN).

LEGEND:

(#) ——— IN CONTRACT

[#] ——— NOT IN CONTRACT



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DATE: 02/24/12

CALIFORNIA HIGH-SPEED RAIL AUTHORITY

PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT

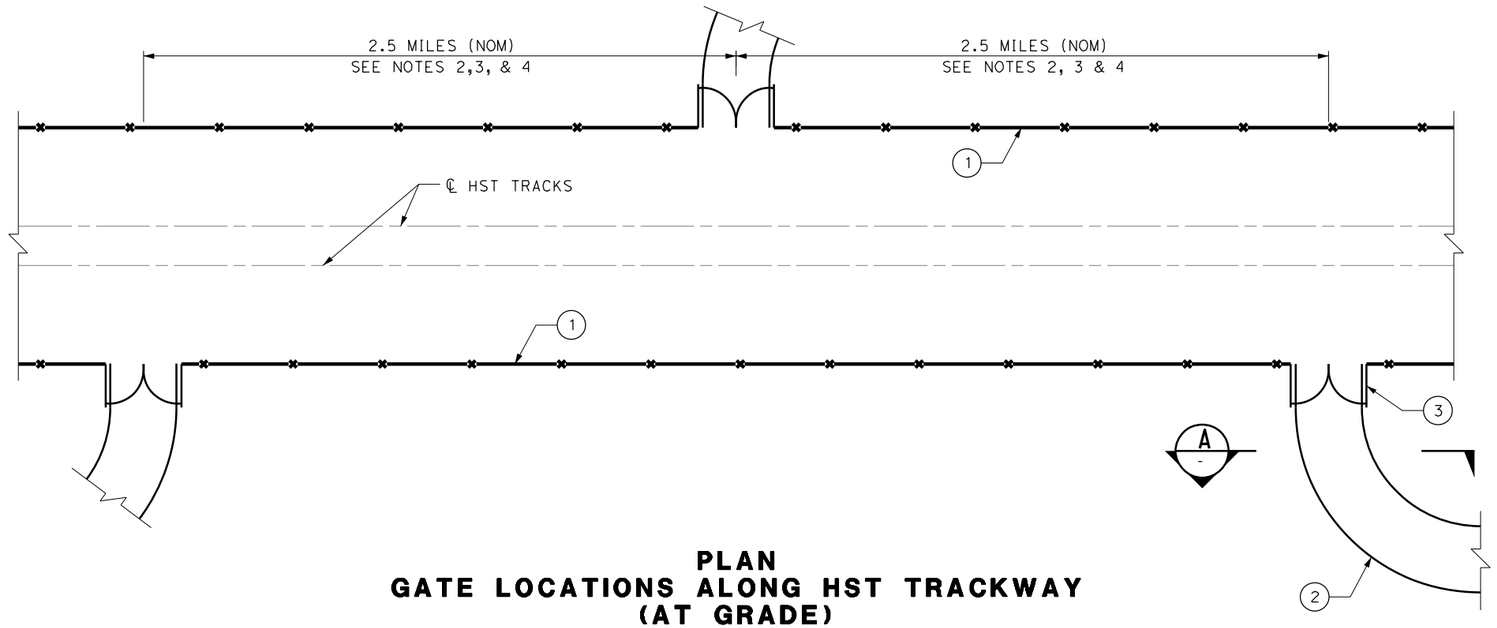
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS

FOUR TRACK AT-GRADE

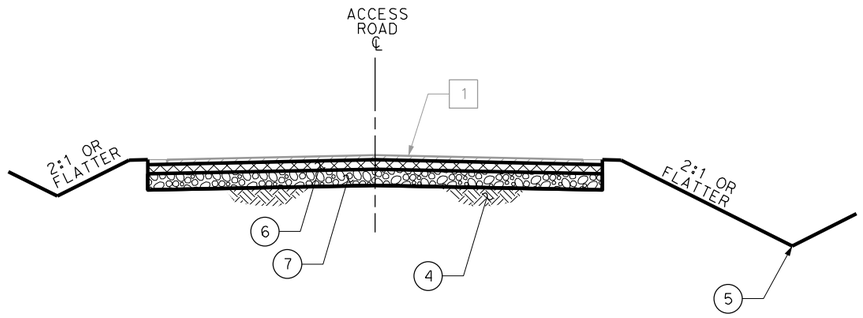
AT INTERMEDIATE HST STATION SECTION

SOW-CP01-006

HSR 13-06 - EXECUTION VERSION



PLAN
GATE LOCATIONS ALONG HST TRACKWAY
(AT GRADE)



SECTION A -

ACCESS ROAD

DATE: 02/24/12

NOTES:

1. SEE DESIGN CRITERIA MANUAL, DIRECTIVE DRAWINGS, AND STANDARD DRAWINGS FOR REQUIREMENTS AND DIMENSIONS.
2. LOCATION OF GATES ALONG AUTHORITY ROW AND FENCING REQUIRES COORDINATION WITH THE LOCAL FIRE PROTECTION AGENCY AND EMERGENCY RESPONDERS.
3. GATES LOCATIONS SHALL BE COORDINATED WITH (I/E. PLACED ADJACENT TO OR NEAR) THE LOCATION OF HST WAYSIDE FACILITIES REQUIRING ACCESS FROM OUTSIDE AUTHORITY ROW.
4. IN GENERAL VEHICULAR ACCESS GATE ALONG AT-GRADE TRACKWAY, SHALL BE LOCATED NOMINALLY AT 2.5 MILE INTERVALS.
5. ACCESS ROADS TO BE GRADE AND GRAVEL ONLY LOCATED AT 2.5 MILE NOMINAL INTERVALS TO COINCIDE WITH VEHICULAR GATE ACCESS.

WORK ELEMENTS (IN CONTRACT)

(1) FENCE
(2) ACCESS ROAD
(3) VEHICULAR ACCESS GATE
(4) COMPACTED SUBGRADE OR UNDISTURBED EARTH (SEE NOTE 5)
(5) DRAINAGE DITCH (TYP)
(6) AGGREGATE BASE
(7) AGGREGATE SUBBASE

WORK ELEMENTS (NOT IN CONTRACT)

[1] ASPHALT CONCRETE

LEGEND:

(#) —— IN CONTRACT
[#] —— NOT IN CONTRACT

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HSR 13-06 - EXECUTION VERSION

CALIFORNIA HIGH-SPEED RAIL AUTHORITY
PARSONS BRINCKERHOFF

CALIFORNIA HIGH-SPEED TRAIN PROJECT
ATTACHMENT 3 - SCOPING TYPICAL SECTIONS

ACCESS ROAD
SOW-CP01-007

California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

ATTACHMENT 4
SCOPE ELEMENTS MATRIX

THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK ELEMENTS

Attachment 4 - Scope Elements Matrix

NO.	WORK ELEMENTS			CP1	REFERENCE	INSTRUCTIONS / DIRECTIONS
	DISCIPLINE	CATEGORY	ITEM			
	INFRASTRUCTURE					
1	SITE WORK	EARTHWORK	GRADING, SIDE SLOPES	YES		CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING OF THE PROJECT ELEMENTS WHICH INCLUDE THE WORK OF HST AND THIRD PARTIES (UPRR, BNSF, CALTRANS, CITY OF FRESNO). CONTRACTOR SHALL MONITOR SETTLEMENTS OF FILL AREAS IN ACCORDANCE WITH DESIGN CRITERIA. CONTRACTOR SHALL PROVIDE PERMANENT SLOPE PROTECTION.
2	SITE WORK	EARTHWORK	SUBGRADE	YES		CONTRACTOR SHALL DESIGN AND INSTALL STABILITY MEASURES TO MEET MAINTENANCE REQUIREMENTS.
3	SITE WORK	EARTHWORK	COMPACTED FILL	YES		
4	SITE WORK	EARTHWORK	SUBBALLAST	NO	YES	CONTRACTOR SHALL ONLY INSTALL PROTECTIVE LAYER FOR PROTECTION OF PREPARED SUBGRADE. REFER TO SCOPE OF WORK.
5	SITE WORK	EARTHWORK	ASPHALT UNDERLAYMENT	YES		CONTRACTOR MAY USE THE ASPHALT UNDERLAYMENT AS AN ALTERNATIVE TO THE SUBBALLAST LAYER IN POOR SOIL CONDITIONS.
6	SITE WORK	SPECIAL TRACKWORK	GRADING OF TRACKWAY IN AREAS OF SPECIAL TRACKWORK AND WAYSIDE EQUIPMENT	YES		CONTRACTOR SHALL INSTALL PROTECTIVE LAYER FOR PROTECTION OF PREPARED SUBGRADE IN AREAS/LIMITS OF SPECIAL TRACKWORK AND WAYSIDE EQUIPMENT THAT WILL BE INSTALLED LATER. REFER TO SCOPE OF WORK.
7	SITE WORK	EARTHWORK	ROCK CONTAINMENT/CATCHMENT	NO	YES	CONTRACTOR SHALL DESIGN AND CONSTRUCT ROCK CONTAINMENT/CATCHMENT (IF APPLICABLE) PER DESIGN CRITERIA.
8	GENERAL	GENERAL	DEMOLITION	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
9	SITE WORK	ACCESS CONTROL	FENCE	YES		CONTRACTOR SHALL FENCE AND FULLY SECURE THE AUTHORITY'S RIGHT-OF-WAY. CONTRACTOR SHALL CONSTRUCT PERMANENT/ULTIMATE FENCING. REFER TO DESIGN CRITERIA. THIRD PARTY FENCING SHALL BE DESIGNED PER THIRD PARTY REQUIREMENTS.
10	SITE WORK	ACCESS CONTROL	GATES (WALKING AND DRIVING)	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
11	SITE WORK	ACCESS ROAD	ACCESS ROADS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT ACCESS ROADS (TO THE TOP OF AGGREGATE BASE). REFER TO SCOPE OF WORK AND DIRECTIVE DRAWINGS.
12	SITE WORK	ACCESS ROAD	COMPACTED SUBGRADE	YES		CONTRACTOR SHALL CONSTRUCT ACCESS ROADS TO THE TOP OF AGGREGATE BASE
13	SITE WORK	ACCESS ROAD	AGGREGATE BASE	YES		CONTRACTOR SHALL CONSTRUCT ACCESS ROADS TO THE TOP OF AGGREGATE BASE
14	SITE WORK	ACCESS ROAD	AGGREGATE SUBBASE	YES		CONTRACTOR SHALL CONSTRUCT ACCESS ROADS TO THE TOP OF AGGREGATE BASE
15	SITE WORK	ACCESS ROAD	ASPHALT CONCRETE	NO		CONTRACTOR SHALL CONSTRUCT ACCESS ROADS TO THE TOP OF AGGREGATE BASE.
16	SITE WORK	INTRUSION PROTECTION AND SAFETY BARRIER	CONCRETE BARRIERS, CONCRETE WALLS, METAL BEAM GUARD RAILS, AND BERMS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE INTRUSION AND SAFETY BARRIERS PER CHSTP, CALTRANS, AND OTHER PARTY'S DESIGN REQUIREMENTS. FOR COLLISION LOADS, REFER TO DESIGN CRITERIA. CONTRACTOR SHALL DESIGN AND CONSTRUCT THE INTRUSION BARRIER INTEGRAL TO THE TRENCH WALL IF IT IS LOCATED ON TOP OF THE TRENCH WALL.
17	SITE WORK	INTRUSION PROTECTION	FENCING AND TRAFFIC BARRIER COMBINATION	YES		CONTRACTOR SHALL DESIGN AND INSTALL INSIDE THE AUTHORITY'S RIGHT-OF-WAY.
18	SITE WORK	INTRUSION PROTECTION	EARTH BERM OR DITCH	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT EARTH BERM OR DITCH.
19	SITE WORK	INTRUSION PROTECTION	HST PIER PROTECTION IN RAILROAD AND/OR HIGHWAY RIGHT-OF-WAY	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE INTRUSION BARRIER. FOR COLLISION LOADS, REFER TO DESIGN CRITERIA. CONTRACTOR SHALL PROVIDE PIER PROTECTION FOR HST PIERS AND THIRD PARTY PIERS PER DESIGN CRITERIA AND THIRD PARTY REQUIREMENTS.
20	SITE WORK	INTRUSION PROTECTION	PROTECTIVE SCREEN (SOLID PLATE) ON HST UNDERPASS STRUCTURES	NO	YES	PROTECTIVE SCREEN WITH SOLID PLATE WILL BE INSTALLED LATER.
21	SITE WORK	SIGNAGE	FENCE SIGNAGE	YES		CONTRACTOR SHALL DESIGN AND INSTALL ACCESS CONTROL SIGNAGE. SIGNS SHALL BE ACCEPTED BY THE AUTHORITY BEFORE FABRICATION.
22	SITE WORK	SIGNAGE	SIGN, POLE, AND FOUNDATION	NO		
23	SITE WORK	SIGNAGE	MILE POST	NO		
24	SITE WORK	SURVEY	SITE SURVEY AND FIELD ENGINEERING	YES		
25	SITE WORK	ROADWAY WORK	MAINTENANCE OF TRAFFIC	YES		CONTRACTOR SHALL DESIGN AND INSTALL TEMPORARY AND PERMANENT TRAFFIC CONTROL DEVICES FOR HIGHWAY AND RAILROADS TO MAINTAIN TRAFFIC FLOW PER DESIGN CRITERIA, CALTRANS, AND THIRD PARTY REQUIREMENTS.
26	SITE WORK	ROADWAY WORK / STRUCTURES	GRADE SEPARATIONS (HST OVERPASS AND UNDERPASS)	YES		ROADWAY WORK SHALL BE DESIGNED AND CONSTRUCTED PER DESIGN CRITERIA AND THIRD PARTY REQUIREMENTS.
27	SITE WORK	ROADWAY WORK	NEW OR MODIFICATIONS TO EXISTING ROADS	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
28	SITE WORK	STRUCTURES	PEDESTRIAN BRIDGES	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PEDESTRIAN BRIDGES PER DESIGN CRITERIA AND THIRD PARTY REQUIREMENTS.
29	SITE WORK	PARKING	FACILITY PARKING DETAIL	NO		
30	SITE WORK	ENVIRONMENTAL	CULVERTS FOR WILDLIFE CROSSINGS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT WILDLIFE CROSSINGS AS INDICATED IN THE ENVIRONMENTAL DOCUMENTS.
31	SITE WORK	ENVIRONMENTAL	HAZARDOUS MATERIALS REMOVAL	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
32	SITE WORK	ENVIRONMENTAL	SOUND WALL AND FOUNDATION (AT-GRADE, CUT/FILL, RETAINED STRUCTURES)	NO	YES	CONTRACTOR SHALL REFER TO ENVIRONMENTAL DOCUMENTS FOR THE LIMITS OF SOUND WALLS. CONTRACTOR SHALL DESIGN PARAPET FOR SLIPSTREAM LOADS PER DESIGN CRITERIA.
32A	SITE WORK	ENVIRONMENTAL	SOUND WALL AND FOUNDATION (ALONG ROEDING PARK)	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE SOUNDWALLS ALONG ROEDING PARK IN DOWNTOWN FRESNO.
33	SITE WORK	ENVIRONMENTAL	LANDSCAPING	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
34	SITE WORK	TRACKWAY DRAINAGE	DRAIN AGGREGATE UNDER CABLE TROUGH	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE SYSTEM, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
35	SITE WORK	TRACKWAY DRAINAGE	UNDERDRAIN SYSTEM	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE SYSTEM, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
36	SITE WORK	TRACKWAY DRAINAGE	PERFORATED PIPE UNDERDRAIN (CLOSED DRAINAGE)	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE SYSTEM, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
37	SITE WORK	TRACKWAY DRAINAGE	GEOTEXTILE FABRIC / GEOFABRIC	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE SYSTEM, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
38	SITE WORK	TRACKWAY DRAINAGE	TRACKSIDE DITCH (OPEN CHANNEL DRAINAGE)	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT OPEN/SURFACE DRAINAGE. REFER TO SCOPE OF WORK.
39	SITE WORK	TRACKWAY DRAINAGE	DRAIN INLET	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE FINAL DRAINAGE SYSTEM. DRAIN INLETS SHALL ACCOMMODATE TEMPORARY AND FINAL DRAINAGE SYSTEM. REFER TO SCOPE OF WORK.
40	SITE WORK	TRACKWAY DRAINAGE	CONNECTION TO STORM DRAIN	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT FOR THE FINAL DRAINAGE SYSTEM AND CONNECT TO LOCAL STORM DRAIN SYSTEMS.

THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK ELEMENTS

NO.	WORK ELEMENTS			CP1	REFERENCE	INSTRUCTIONS / DIRECTIONS
	DISCIPLINE	CATEGORY	ITEM			
41	SITE WORK	TRACKWAY DRAINAGE	DETENTION BASIN	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT DETENTION BASINS TO ACCOMMODATE THE FINAL DRAINAGE SYSTEM.
42	SITE WORK	TRACKWAY DRAINAGE	SIPHONS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT SIPHONS (IF REQUIRED).
43	SITE WORK	TRACKWAY DRAINAGE	ENERGY DISSIPATORS	NO	YES	
44	SITE WORK	DRAINAGE	CULVERTS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT CULVERTS (IF REQUIRED).
45	SITE WORK	DRAINAGE	PUMP STATIONS (THIRD PARTY)	YES		CONTRACTOR SHALL DESIGN AND INSTALL PUMP STATIONS (AS NEEDED) FOR THIRD PARTY ENTITIES PER THAT ENTITY'S REQUIREMENTS.
46	SITE WORK	DRAINAGE	ROADWAY DRAINAGE	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT ROADWAY DRAINAGE SYSTEM PER JURISDICTIONAL REQUIREMENTS
47	SITE WORK	UTILITIES	WATERPROOFING SYSTEM AT STRUCTURE/UTILITY INTERFACES	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT STRUCTURE/UTILITY PENETRATIONS SO THAT IT DOES NOT COMPROMISE THE INTEGRITY OF WATERPROOFING OF THE STRUCTURE.
48	SITE WORK	UTILITIES	RELOCATION OF EXISTING UTILITIES	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
49	SITE WORK	UTILITIES	CORROSION CONTROL	YES		CONTRACTOR SHALL DESIGN AND INSTALL UTILITY CORROSION CONTROL, UNLESS PERFORMED BY THE UTILITY OWNER.
50	SITE WORK	UTILITIES	VENT PIPE RISER	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT VENT PIPE RISER, UNLESS PERFORMED BY THE UTILITY OWNER.
51	SITE WORK	UTILITIES	SHUTOFF VALVE	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT SHUTOFF VALVES PER THE REQUIREMENTS OF THE UTILITY OWNER (IF REQUIRED)
52	SITE WORK	LOW VOLTAGE UNDER TRACK CROSSING	UNDER TRACK CONDUITS IN DUCTBANKS AND MANHOLES (AT-GRADE, CUT/EMBANKMENT, TRENCH AND RETAINED STRUCTURES)	YES		CONTRACTOR SHALL LOCATE, DESIGN AND CONSTRUCT LOW-VOLTAGE UNDER TRACK CONDUIT DUCTBANKS AND ACCOMPANYING MANHOLES IN AT-GRADE, CUT/FILL, TRENCH AND RETAINED TRACKWAY SECTIONS TO SERVE TRACTION POWER FACILITIES, TRAIN CONTROL FACILITIES, STAND ALONE RADIO SITES AND STATION PLATFORMS. REFER TO THE SCOPE OF WORK AND COMMUNICATIONS CHAPTER OF THE DESIGN CRITERIA FOR DETAILS. PRELIMINARY DESIGN HAS LOCATED THE FOLLOWING QUANTITIES OF LOW-VOLTAGE UNDERTRACK ASSEMBLIES (ONE DUCTBANK WITH TWO MANHOLES). THE UNDER TRACK CROSSINGS GENERALLY COINCIDE WITH FUTURE SYSTEMS, STATION, AND OTHER FACILITIES. THE FOLLOWING LOCATIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL COORDINATE FINAL LAYOUTS, LOCATIONS, AND DESIGN WITH THE AUTHORITY. <u>HYBRID ALTERNATIVE</u> TWELVE-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 4 AT APPROXIMATE LOCATIONS: 2327+00, 2387+00, 2491+00, 2650+00 TWENTY-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 6 AT APPROXIMATE LOCATIONS: 2225+00, 2240+00, 2253+00, 2568+00, 2582+00, 2596+00 <u>ALIGNMENT 1A</u> TWELVE-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 4 AT APPROXIMATE LOCATIONS: S10545+00, S10600+00, S10830+00, S10911+00 TWENTY-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 3 AT APPROXIMATE LOCATIONS: S10854+00, S10864+00, S10875+00 <u>ALIGNMENT 1B</u> TWELVE-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 3 AT APPROXIMATE LOCATIONS: S10992+00, S11007+00, S11020+00 TWENTY-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 4 AT APPROXIMATE LOCATIONS: S10970+00, S10983+00, S11008+00, S11018+00 <u>ALIGNMENT 1C</u> TWELVE-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 1 AT APPROXIMATE LOCATIONS: S11290+00 TWENTY-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 4 AT APPROXIMATE LOCATIONS: S11030+00, S11043+00, S11055+00, S11066+00
53	SITE WORK	LOW VOLTAGE UNDER GROUND CROSSING	UNDER GROUND CONDUITS IN DUCTBANKS AND MANHOLES (AT-GRADE, CUT/EMBANKMENT, TRENCH AND RETAINED STRUCTURES)	YES		CONTRACTOR SHALL LOCATE, DESIGN AND CONSTRUCT LOW-VOLTAGE UNDER GROUND CONDUIT DUCTBANKS AND ACCOMPANYING MANHOLES IN AT-GRADE, CUT/FILL, TRENCH AND RETAINED TRACKWAY SECTIONS TO SERVE TRACTION POWER FACILITIES, TRAIN CONTROL FACILITIES AND STAND ALONE RADIO SITES SEPARATED FROM THE HSR TRACKWAY BY NON-HSR PROPERTY. REFER TO THE SCOPE OF WORK AND COMMUNICATIONS CHAPTER OF THE DESIGN CRITERIA FOR DETAILS. PRELIMINARY DESIGN HAS LOCATED THE FOLLOWING QUANTITIES OF LOW-VOLTAGE UNDERTRACK ASSEMBLIES (ONE DUCTBANK WITH TWO MANHOLES). THE UNDER GROUND CROSSINGS GENERALLY COINCIDE WITH FUTURE SYSTEMS, STATION, AND OTHER FACILITIES. THE FOLLOWING LOCATIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL COORDINATE FINAL LAYOUTS, LOCATIONS, AND DESIGN WITH THE AUTHORITY. <u>ALIGNMENT 1A</u> TWELVE-CONDUIT LOW-VOLTAGE DUCTBANK AND TWO LOW-VOLTAGE MANHOLE ASSEMBLY: QUANTITY 3 AT APPROXIMATE LOCATIONS: S10545+00, S10600+00, S10830+00
54	SITE WORK	25KV UNDER GROUND CROSSING	UNDER GROUND CONDUITS IN DUCTBANKS AND MANHOLES (AT-GRADE, CUT/EMBANKMENT, TRENCH AND RETAINED STRUCTURES)	YES		CONTRACTOR SHALL LOCATE, DESIGN AND CONSTRUCT 25KV UNDER GROUND CONDUIT DUCTBANKS AND ACCOMPANYING MANHOLES IN AT-GRADE, CUT/FILL, TRENCH AND RETAINED TRACKWAY SECTIONS TO SERVE TRACTION POWER FACILITIES SEPARATED FROM THE HSR TRACKWAY BY NON-HSR PROPERTY. REFER TO THE SCOPE OF WORK AND TRACTION POWER SUPPLY SYSTEM CHAPTER OF THE DESIGN CRITERIA FOR DETAILS. PRELIMINARY DESIGN HAS LOCATED THE FOLLOWING QUANTITIES OF 25KV UNDER GROUND ASSEMBLIES (ONE DUCTBANK WITH TWO MANHOLES). THE UNDER GROUND CROSSINGS GENERALLY COINCIDE WITH FUTURE SYSTEMS, STATION, AND OTHER FACILITIES. THE FOLLOWING LOCATIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL COORDINATE FINAL LAYOUTS, LOCATIONS, AND DESIGN WITH THE AUTHORITY. <u>ALIGNMENT 1A</u> EIGHT-CONDUIT 25KV DUCTBANK AND TWO 25KV MANHOLE ASSEMBLY: QUANTITY 12 FOUR ASSEMBLIES AT APPROXIMATE LOCATIONS: S10546+00, S10601+00, S10831+00
55	SITE WORK	UNDER TRACK CROSSING	UNDER TRACK CONDUITS (AERIAL, TRENCH, C&C STRUCTURES)	NO	YES	CONTRACTOR SHALL NOT CONSTRUCT UNDER TRACK CONDUITS FOR AERIAL, TRENCH, AND C&C STRUCTURES. REFER TO THE COMMUNICATIONS CHAPTER OF THE DESIGN CRITERIA.
56	STRUCTURES	CABLE TROUGH	CABLE TROUGH - AERIAL STRUCTURE	NO	YES	CONTRACTOR SHALL DESIGN AND CONSTRUCT THE CABLE TROUGH WALL FOR THE CONCRETE PARAPET CONNECTION. REMOVABLE PRECAST COVERS ARE NOT INCLUDED. REFER TO SCOPE OF WORK TYPICAL SECTION EXHIBIT.
57	STRUCTURES	CABLE TROUGH	CABLE TROUGH - TRENCH AND C&C STRUCTURES	NO	YES	
58	STRUCTURES	CABLE TROUGH	CABLE TROUGH - CUT/FILL, RETAINED STRUCTURES	NO	YES	CONTRACTOR SHALL USE THE SAME-GRADED MATERIAL AS THE EMBANKMENT FOR EASE OF FUTURE CABLE TROUGH INSTALLATION.

THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK ELEMENTS

Attachment 4 - Scope Elements Matrix

NO.	WORK ELEMENTS			CP1	REFERENCE	INSTRUCTIONS / DIRECTIONS
	DISCIPLINE	CATEGORY	ITEM			
59	STRUCTURES	CABLE TROUGH	CABLE TROUGH TRANSITIONS	NO	YES	
60	STRUCTURES	RETAINING WALL	RETAINING WALL	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
61	STRUCTURES	RETAINING WALL	FALL PROTECTION	YES		CONTRACTOR SHALL ENSURE FALL PROTECTION DESIGN MEETS MINIMUM REQUIREMENTS PER DESIGN CRITERIA.
62	STRUCTURES	RETAINING WALL	FLOOD PROTECTION / INTRUSION PROTECTION	YES		WALL HEIGHTS MAY BE HIGHER AS REQUIRED FOR FLOOD ELEVATION AND INTRUSION PROTECTION REQUIREMENTS.
63	STRUCTURES	RETAINING WALL	RETAINING WALL DRAINAGE	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT/ULTIMATE DRAINAGE SYSTEM FOR THE RETAINING WALL.
64	STRUCTURES	RETAINING WALL	TOP OF RETAINING WALL GUTTER	YES		
65	STRUCTURES	RETAINING WALL	CONTINUOUS DRAINAGE BLANKET BEHIND EVERY WALL	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT/ULTIMATE DRAINAGE SYSTEM FOR THE RETAINING WALL.
66	STRUCTURES	RETAINING WALL	PERFORATED UNDERDRAIN AT THE BOTTOM OF WALL BEHIND THE FILL	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT/ULTIMATE DRAINAGE SYSTEM FOR THE RETAINING WALL.
67	STRUCTURES	RETAINING WALL	WEEP HOLES	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT/ULTIMATE DRAINAGE SYSTEM FOR THE RETAINING WALL.
68	AERIAL STRUC.	GENERAL	EXIT STAIRWAYS	NO	YES	
69	AERIAL STRUC.	GENERAL	DERAILMENT PROTECTION WALL AND SLEEVES	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT DERAILMENT PROTECTION WALLS PER LOAD REQUIREMENTS IN THE DESIGN CRITERIA AND AS SHOWN ON DIRECTIVE DRAWINGS. DERAILMENT PROTECTION WALLS SHALL INCLUDE THE CABLE TROUGH SIDE WALL ON AERIAL STRUCTURES. REFER TO SCOPE OF WORK TYPICAL SECTION EXHIBIT.
70	AERIAL STRUC.	GENERAL	CONCRETE PARAPET	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT CONCRETE PARAPET PER DESIGN CRITERIA AND DIRECTIVE DRAWINGS.
71	AERIAL STRUC.	SOUND WALL	SOUND WALL	NO	YES	CONTRACTOR SHALL REFER TO ENVIRONMENTAL DOCUMENTS FOR THE LIMITS OF SOUND WALLS. CONTRACTOR SHALL DESIGN PARAPET FOR SLIPSTREAM LOADS PER DESIGN CRITERIA. CONTRACTOR SHALL DESIGN PARAPET ON AERIAL STRUCTURES TO ACCOMMODATE FOR FUTURE INSTALLATION AND LOADING OF SOUND WALL PER DESIGN CRITERIA.
72	AERIAL STRUC.	GENERAL	EXPANSION JOINT	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PER DESIGN CRITERIA
73	AERIAL STRUC.	GENERAL	BEARINGS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PER DESIGN CRITERIA
74	AERIAL STRUC.	GENERAL	SHEAR KEY	YES		
75	AERIAL STRUC.	SUPERSTRUCTURE	BOX GIRDER	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PER DESIGN CRITERIA
76	AERIAL STRUC.	SPECIAL TRACKWORK	TURNOUTS AND CROSSOVERS	NO	YES	CONTRACTOR SHALL DESIGN THE AERIAL STRUCTURE TO CONSIDER THE EFFECTS OF TURNOUTS AND CROSSOVERS ON THE STRUCTURE JOINTS.
77	AERIAL STRUC.	OCS FOUNDATION	SLEEVES AT OVERHANG OF BOX GIRDERS	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT SLEEVES AT OVERHANG OF BOX GIRDERS SPACED AT 30 FEET MAXIMUM FOR FUTURE OVERHEAD CATENARY SYSTEM FOUNDATION AND CONDUITS FOR CABLE ROUTING
78	AERIAL STRUC.	SUBSTRUCTURE	PIER CAP, PIER, AND FOUNDATION	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PER DESIGN CRITERIA
79	AERIAL STRUC.	DRAINAGE	DRAINAGE INLET, WEIR, DOWNSPOUT, DRAINAGE CLEANOUT, CONNECTION TO EXISTING OR PROPOSED DRAINAGE SYSTEM	YES		CONTRACTOR SHALL DESIGN AERIAL STRUCTURE DRAINAGE SYSTEM PER DESIGN CRITERIA AND DIRECTIVE DRAWINGS. CONTRACTOR SHALL DESIGN AND INSTALL THE DRAIN PIPE (EMBEDDED IN PIER) AND SHALL NOT INTERRUPT THE SUBSTRUCTURE REINFORCEMENT, ESPECIALLY IN THE PLASTIC HINGE POINT. CONTRACTOR SHALL CONNECT THE DRAIN PIPE TO A DRAINAGE SYSTEM.
80	AERIAL STRUC.	FIXED EQUIPMENT	SURFACE MOUNTED PULL BOXES	NO		
81	AERIAL STRUC.	FIXED EQUIPMENT	EXPOSED CONDUITS, EXPANSION AND DEFLECTION FITTINGS, SUPPORTING STEEL AND HARDWARE, EXTERIOR AESTHETIC CLADDING SYSTEM	NO		
82	AERIAL STRUC.	FIXED EQUIPMENT	CONCRETE PROTECTION CURB TO PROTECT EXPOSED CONDUITS	NO		
83	TRENCH	GENERAL	FALL PROTECTION	YES		CONTRACTOR SHALL ENSURE DESIGN OF FALL PROTECTION MEETS THE MINIMUM REQUIREMENTS PER DESIGN CRITERIA.
84	TRENCH	GENERAL	FLOOD PROTECTION / INTRUSION PROTECTION	YES		WALL HEIGHTS MAY BE HIGHER AS REQUIRED FOR FLOOD ELEVATION AND INTRUSION PROTECTION REQUIREMENTS. CONTRACTOR SHALL DESIGN AND CONSTRUCT INTRUSION BARRIERS THAT ARE INTEGRAL WITH THE TRENCH WALL.
85	TRENCH	GENERAL	STRUT	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT PERMANENT STRUTS (IF REQUIRED).
86	TRENCH	STRUCTURES / UTILITY / CIVIL	INTERMITTENT ROOF SLAB FOR UTILITY AND ROADWAY CROSSING	YES		
87	TRENCH / C&C	GENERAL	NICHES	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT NICHES FOR THE PERMANENT/ULTIMATE CONDITION OF THE STAIRWAYS AND SUMP PUMPS THAT WILL BE INSTALLED LATER.
88	TRENCH / C&C	GENERAL	BASE SLAB	YES		
89	TRENCH / C&C	GENERAL	WALKWAY AND INVERT SLAB	NO		
90	TRENCH / C&C	GENERAL	INTEGRAL CONCRETE WALL	YES		
91	TRENCH / C&C	GENERAL	COMPACTED BACKFILL / STRUCTURAL FILL	YES		
92	TRENCH / C&C	GENERAL	CONSTRUCTION JOINT WITH WATERSTOP	YES		
93	TRENCH / C&C	GENERAL	FULL PERIMETER WATERPROOFING	YES		CONTRACTOR SHALL DESIGN AND INSTALL WATERPROOFING FOR TRENCHES AND CUT-AND-COVER STRUCTURES.
94	TRENCH / C&C	GENERAL	DEWATERING	YES		CONTRACTOR SHALL DESIGN AND INSTALL DEWATERING FOR CONSTRUCTION OF TRENCHES AND CUT-AND-COVER STRUCTURES (CRUSHED STONE IS PART OF AN ACCEPTABLE METHOD FOR DEWATERING.)
95	TRENCH / C&C	FIXED EQUIPMENT	LIGHT FIXTURES	NO		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE TRENCH WALL TO ENSURE THAT CONTINUOUS AND INTERMITTENT FIXED EQUIPMENT CAN BE INSTALLED LATER WITHOUT INTERFERING WITH THE STRUCTURAL REINFORCEMENT OF THE WALL.
96	TRENCH / C&C	FIXED EQUIPMENT	WALKWAY HANDRAILS	NO	YES	CONTRACTOR SHALL DESIGN AND CONSTRUCT THE TRENCH WALL TO ENSURE THAT CONTINUOUS AND INTERMITTENT HANDRAIL CAN BE INSTALLED LATER WITHOUT INTERFERING WITH THE STRUCTURAL REINFORCEMENT OF THE WALL.
97	TRENCH / C&C	FIXED EQUIPMENT	EMBEDDED CONDUITS IN WALKWAY AND INVERT SLAB FOR CABLE ROUTING	NO		
98	TRENCH / C&C	DRAINAGE	DRAIN AND INLET	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE CONDITION, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
99	TRENCH / C&C	DRAINAGE	INVERT FOR TRACKBED	NO	YES	CONTRACTOR SHALL DESIGN INVERT SLAB THICKNESS TO ACCOMMODATE THE TRACK DRAINAGE SYSTEM.
100	TRENCH / C&C	DRAINAGE	SUMP PUMP	NO	YES	CONTRACTOR SHALL DESIGN FOR THE FINAL DRAINAGE CONDITION, BUT CONSTRUCT WHAT IS NEEDED TO ACCOMMODATE TEMPORARY DRAINAGE CONDITIONS. REFER TO SCOPE OF WORK.
101	C&C	GENERAL	VENTILATION STRUCTURE	NO	YES	CONTRACTOR SHALL KEEP THE LENGTH OF THE C&C SECTION SO THAT NO VENTILATION IS REQUIRED.
102	C&C	GENERAL	PORTAL FACILITY	NO	YES	
103	STATIONS	STRUCTURE	PASSENGER STATION BUILDING	NO		
104	STATIONS	GENERAL	STATION FURNITURES, FIXTURES, AND EQUIPMENT	NO		
105	STATIONS	WALL	SCREEN WALL	NO		
106	STATIONS	TRACKWAY DRAINAGE	DRAINAGE INLET	YES		CONTRACTOR SHALL DESIGN AND CONSTRUCT THE PERMANENT DRAINAGE SYSTEM INCLUDING THE INLETS UP TO SUBGRADE LEVEL AND INSTALL TEMPORARY CAP OVER THE INLET.
107	STATIONS	PLATFORM	STATION PLATFORM	NO	YES	
108	TRACK	GENERAL	RAIL AND FASTENERS	NO		
109	TRACK	NON-BALLASTED	NON-BALLASTED TRACK	NO	YES	

THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK ELEMENTS

NO.	WORK ELEMENTS			CP1	REFERENCE	INSTRUCTIONS / DIRECTIONS
	DISCIPLINE	CATEGORY	ITEM			
110	TRACK	NON-BALLASTED	AC LAYER	NO		
111	TRACK	NON-BALLASTED	SLEEVES FOR CABLE ROUTING	NO		
112	TRACK	BALLASTED	BALLAST (INCLUDING BALLAST BELOW TIE)	NO	YES	
113	TRACK	BALLASTED	CONCRETE TIES	NO		
114	TRACK	BALLASTED	WOOD TIES	NO		
115	TRACK	BALLASTED	EMBEDDED CONDUITS WITHIN BALLAST TRACKWORK	NO		
116	TRACK	TRACKWORK	BUMPING POSTS	NO		
117	TRACK	TRACKWORK	DERAILS	NO		
118	TRACK	TRACKWORK	STRETCHER BARS	NO		
119	TRACK	TRACKWORK	ATC CROSSING BONDING	NO		
120	TRACK	SPECIAL TRACKWORK	SWITCH RAILS	NO		
121	TRACK	SPECIAL TRACKWORK	TURNOUTS AND CROSSOVERS	NO	YES	CONTRACTOR SHALL DESIGN FOR THE LOCATION AND SPACE REQUIREMENTS OF OPERATING MECHANISMS, SIGNAL EQUIPMENT, AND OTHER WAYSIDE FACILITIES. CONTRACTOR SHALL DESIGN THE FUTURE LOCATION FOR EASE OF ACCESS TO THE WAYSIDE FACILITIES.
122	TRACK	SPECIAL TRACKWORK	TURNOUT GUARD RAILS (OR CHECK RAILS)	NO		
123	TRACK	SPECIAL TRACKWORK	SWITCH MACHINES	NO	YES	CONTRACTOR SHALL DESIGN THE FUTURE LOCATION OF SWITCH MACHINES FOR EASE OF ACCESS TO THE WAYSIDE FACILITIES.
124	TRACK	SPECIAL TRACKWORK	SWITCH HEATERS	NO		
	SYSTEMS					
125	OCS	ASSEMBLY	OCS POLE AND FOUNDATION	NO	YES	
126	OCS	ASSEMBLY	OCS ASSEMBLY	NO		
127	OCS	ASSEMBLY	OCS POLE NUMBER PLATE	NO		
128	OCS	ASSEMBLY	OCS CONTACT WIRE	NO		
129	OCS	ASSEMBLY	MESSENGER WIRE	NO		
130	OCS	ASSEMBLY	NEGATIVE FEEDER WIRE	NO		
131	OCS	ASSEMBLY	STATIC WIRE	NO		
132	OCS	ASSEMBLY	PORTAL STRUCTURE OPENING	NO		
133	OCS	BALANCE WEIGHT	POLE BRACKET	NO		
134	OCS	BALANCE WEIGHT	CABLE TERMINATION CLAMP	NO		
135	OCS	BALANCE WEIGHT	OCS BALANCE WEIGHT POLE	NO		
136	OCS	BALANCE WEIGHT	TURNBUCKLE	NO		
137	OCS	BALANCE WEIGHT	ANCHOR U-BOLT	NO		
138	OCS	BALANCE WEIGHT	CATENARY INSULATED TERMINATION	NO		
139	OCS	BALANCE WEIGHT	POLE DOWN GUY BRACKET	NO		
140	OCS	BALANCE WEIGHT	BALANCE WEIGHT ANCHOR ASSEMBLY	NO		
141	OCS	L.V. DISTRIBUTION	25KV/480V TRANSFORMER	NO		
142	OCS	L.V. DISTRIBUTION	WEATHER HEAD	NO		
143	OCS	L.V. DISTRIBUTION	L.V. DISCONNECT SWITCH AND MOUNTING HARDWARE	NO		
144	OCS	L.V. DISTRIBUTION	CONDUCTORS AND MOUNTING HARDWARE	NO		
145	OCS	L.V. DISTRIBUTION	EXPOSED CONDUIT EXTENSIONS	NO		
146	OCS	GROUNDING & BONDING	GROUNDING AND BONDING ARRANGEMENT FOR OVERHEAD BRIDGES	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
147	OCS	GROUNDING & BONDING	GROUNDING AND BONDING ARRANGEMENT FOR HST STRUCTURES (I.E., AERIAL STRUCTURE, TRENCH, FENCE, ETC.)	YES		CONTRACTOR SHALL REFER TO SCOPE OF WORK.
148	OCS / TPS	OCS FEEDER	MAIN GANTRY AND FOUNDATION	NO		
149	OCS / TPS	OCS FEEDER	STRAIN GANTRY AND FOUNDATION	NO		
150	OCS / TPS	OCS FEEDER	ACROSS TRACK OCS CATENARY/FEEDER WIRE TO STRAIN GANTRY	NO		
151	OCS / TPS	OCS FEEDER	STANDOFF INSULATOR	NO		
152	OCS / TPS	OCS FEEDER	SURGE ARRESTER	NO		
153	OCS / TPS	OCS FEEDER	POTENTIAL TRANSFORMER	NO		
154	OCS / TPS	OCS FEEDER	ALUMINUM BUSBAR	NO		
155	OCS / TPS	OCS FEEDER	MOTOR OPERATED DISCONNECT SWITCH ASSEMBLY	NO		
156	TPS	FACILITIES	SUBSTATION	NO	YES	
157	TPS	FACILITIES	SWITCHING STATION	NO	YES	
158	TPS	FACILITIES	PARALLELING STATION	NO	YES	
159	TPS	FACILITIES	WAYSIDE POWER CONTROL CUBICLE	NO		
160	MOD	GROUND SWITCH	DISCONNECT SWITCH, ROD AND MOUNTING HARDWARE	NO		
161	MOD	GROUND SWITCH	2X25KV DISCONNECT SWITCH	NO		
162	MOD	GROUND SWITCH	SWITCH SUPPORT	NO		
163	MOD	GROUND SWITCH	ADJUSTABLE BRACE	NO		
164	MOD	GROUND SWITCH	DRIVE PIPE	NO		
165	MOD	GROUND SWITCH	GROUND WORKING PLATFORM AND GROUND CONNECTION	NO		

THE WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING WORK ELEMENTS

NO.	WORK ELEMENTS			CP1	REFERENCE	INSTRUCTIONS / DIRECTIONS
	DISCIPLINE	CATEGORY	ITEM			
166	ATC	WAYSIDE	TRAIN CONTROL HOUSES	NO	YES	
167	ATC	WAYSIDE	DWARF SIGNALS	NO		
168	ATC	TRACKWORK	IMPEDANCE BOND	NO		
169	ATC	TRACK CIRCUIT	1-2" CONDUIT TO POWER COMPARTMENT	NO		
170	ATC	TRACK CIRCUIT	2" CONDUIT TO ATC/COMMS COMPARTMENT	NO		
171	ATC	TRACK CIRCUIT	CONDUIT EXTENSION	NO		
172	ATC	TRACK CIRCUIT	WORKING PLATFORM	NO		
173	ATC	TRACK CIRCUIT	GROUND ROD, CONDUCTOR, AND TERMINATION HARDWARE	NO		
174	ATC	TRACK CIRCUIT	POWER COMPARTMENT	NO		
175	ATC	TRACK CIRCUIT	EQUIPMENT CASE FOUNDATION	NO		
176	ATC	TRANSPONDER	ATC TRANSPONDERS AND MOUNTING HARDWARE	NO		
177	ATC	SPECIAL TRACKWORK	SWITCH MACHINE AND RODS	NO		
178	ATC	SPECIAL TRACKWORK	ATC SIGNAL	NO		
179	ATC / COMM	TRACK CIRCUIT	ATC EQUIPMENT CASE	NO		
180	COMM	COMM	STAND-ALONE RADIO SITES	NO	YES	
181	COMM	COMM	COMMUNICATION SHELTERS	NO	YES	
182	COMM	TRENCH	RADIO (LATERAL) COMMUNICATION CABLES TO RADIO EQUIPMENT	NO		
183	COMM	TRENCH	TRACKSIDE RADIO (LONGITUDINAL) CABLES	NO		
184	COMM	SCS	SCS EQUIPMENT CASE AND FOUNDATION	NO		
185	COMM	SCS	1-2" CONDUIT TO POWER COMPARTMENT	NO		
186	COMM	SCS	2" CONDUIT TO ATC/COMMS COMPARTMENT	NO		
187	COMM	SCS	SCADA INTERFACE CABINET	NO		
	OPERATIONS & MAINTENANCE					
188	O&M	O&M	LIGHTING REQUIREMENTS AND PUMPS	YES		CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN AND CONSTRUCTION OF TEMPORARY FACILITIES THAT NEED TO BE LEFT IN PLACE AFTER THE COMPLETION OF THE CONTRACT. REFER TO SCOPE OF WORK.
189	O&M	INTRUSION	INTRUSION DETECTION	NO		
190	O&M	DERAILMENT	POWER OPERATED DERAIL DEVICES	NO		
191	O&M	FACILITIES	OPERATIONS CONTROL CENTER	NO		
192	O&M	FACILITIES	REGIONAL CONTROL CENTER	NO		
193	O&M	FACILITIES	YARD CONTROL CENTER	NO		
194	O&M	FACILITIES	YARD CONTROL TOWER EQUIPMENT ROOM	NO		
195	O&M	FACILITIES	TERMINAL CONTROL CENTER	NO		
196	O&M	FACILITIES	STATION CONTROL ROOM	NO		
197	O&M	FACILITIES	INCIDENT COMMAND POST	NO		
198	O&M	FACILITIES	HEAVY MAINTENANCE FACILITY	NO		
199	O&M	FACILITIES	OVERNIGHT LAYUP FACILITY	NO		
200	O&M	FACILITIES	PERIODIC INSPECTION FACILITY	NO		
201	O&M	FACILITIES	ROLLING STOCK MAINTENANCE	NO		
202	O&M	FACILITIES	MAINTENANCE OF INFRASTRUCTURE YARD	NO		
203	O&M	FACILITIES	MAINTENANCE OF INFRASTRUCTURE SIDING	NO		

California High-Speed Train Project

Agreement No.: HSR 13-06

Scope of Work

ATTACHMENT 5
MANDATORY STANDARD SPECIFICATIONS LISTING

Construction Package 1 - Standard Specifications
Listing of Sections, Articles, and Paragraphs that are Contract Requirements

Notes:

1. Sections listed are for reference unless the entire Section is or parts of the Section (specific Parts, Articles, or Paragraphs) are indicated as Contract requirements. Listing of Article or Paragraph includes all Paragraphs (and subparagraphs) under listed Article or Paragraph.
2. Wherever portion of the Standard Specifications included as a Contract requirement (mandatory) refers to a portion of the Standard Specifications included as reference, the referenced portion is mandatory, as directly applicable to the portion of the Standard Specifications included as a Contract requirement. Otherwise, the reference specifications section, by itself, remains as reference.

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
Sec. No.	**DIV 02 TECHNICAL GENERAL REQUIREMENTS AND EXISTING CONDITIONS**	
02 01 00	STANDARD SPECIFICATIONS GENERAL STATEMENTS	Entire Section
02 01 56.39	TEMPORARY TREE AND PLANT PROTECTION	
02 21 13	SITE SURVEYS	Entire Section
02 21 23	FIELD ENGINEERING	Entire Section
02 21 33	PHOTOGRAPHIC DOCUMENTATION	Entire Section
02 22 00	EXISTING CONDITIONS ASSESSMENT	Entire Section
02 41 00	DEMOLITION	

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
Sec. No.	**DIV 03 CONCRETE**	
03 05 15	PORTLAND CEMENT CONCRETE	Entire Section
03 05 18	PRESTRESSED CONCRETE	Entire Section
03 11 00	CONCRETE FORMING	1.3 Reference Standards 1.4 Quality Assurance
03 11 14	FALSEWORK	1.4 Submittals 2.3B. Design criteria regarding railroads
03 15 00	CONCRETE ACCESSORIES	
03 15 13	WATERSTOPS	Part 2- Products
03 15 23	CONCRETE ANCHORS	Entire Section
03 15 15	ELASTOMERIC BEARING PADS	
03 20 00	CONCRETE REINFORCING	Entire Section
03 30 00	CAST-IN-PLACE CONCRETE	1.3 Reference Standards 1.4 Submittals 1.5 Quality Assurance
03 35 00	CONCRETE FINISHING	1.3 Reference Standards 1.5 Quality Assurance
03 37 13	SHOTCRETE	1.2 Reference Standards 1.5 Quality Assurance 3.6 Field Quality Control
03 40 00	PRECAST CONCRETE	1.3 Reference. Standards 1.5 Submittals 1.6 Quality Assurance 2.3 Source Quality Control
03 43 00	PRECAST CONCRETE SEGMENTAL CONSTRUCTION	Entire Section

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
03 62 00	NON-SHRINK GROUTING	1.4 Reference Standards 2.2 Source Quality Control
03 70 00	MASS CONCRETE	Entire Section
Sec. No.	**DIV 05 METALS**	
05 05 22	METAL WELDING	Entire Section
05 12 00	STRUCTURAL STEEL FRAMING	Entire Section
05 50 00	METAL FABRICATIONS	
05 51 00	METAL STAIRS	1.3 Reference Standards 1.5 Regulatory Requirements
Sec. No.	**DIV 07 THERMAL AND MOISTURE PROTECTION**	
07 95 63	BRIDGE BEARINGS	1.3 Reference Standards; 1.4 Submittals 2.3 Design Requirements 3.1 Sampling, Testing, and Inspection 3.3 Field Quality Control
07 95 66	BRIDGE EXPANSION JOINT ASSEMBLIES	1.3 Reference Standards 1.4 Submittals 1.5 Quality Assurance 2.3 Design Requirements 3.2 Field Quality Control
07 95 73	TUNNEL SEISMIC JOINT ASSEMBLIES	

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
Sec. No.	**DIV 09 FINISHES**	
09 96 00	HIGH-PERFORMANCE COATINGS	1.3 Reference Standards; 1.5 Pre-Application Meetings 1.6 Submittals 1.7 Quality Assurance 1.8 Delivery, Storage, and Protection 2.1 Products 2.2 Shop Quality Control 3.5 Field Quality Control 3.8A. Interior Surfaces of Steel Structures
Sec. No.	**DIV 31 EARTHWORK**	
31 05 00	COMMON WORK RESULTS FOR EARTHWORK	1.4 Reference Standards 1.5 Classifications of Earthwork 1.6 Submittals 1.7 Regulatory Requirements 1.8 Quality Assurance 2.2 Fill and Backfill Materials – Specific Requirements 2.4 Source Quality Control 3.3C. Erosion Protection 3.11 Compaction 3.15 Field Quality Control
31 09 13	GEOTECHNICAL INSTRUMENTATION AND MONITORING	Entire Section
31 11 00	CLEARING AND GRUBBING	Entire Section
31 23 19	DEWATERING	Entire Section
31 23 26	AGGREGATE DRAINAGE LAYER	
31 35 00	SLOPE PROTECTION	
31 35 33	TURF AND HYDROSEED SLOPE PROTECTION	

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
31 38 13	REINFORCED SLOPES AND EARTH STRUCTURES	1.4 Reference Standards 1.5 Submittals 1.7 Design Requirements 1.8 Qualifications of Supplier 1.9A. Delivery, Storage and Handling 2.1B.1 Soil Reinforcement 3.4 Field Quality Control
31 39 13	GROUND ANCHORS	1.4 Regulatory Requirements 1.5 Submittals 1.6 Quality Assurance 2.2 Design Requirements 3.3 Corrosion Protection 3.5 Field Quality Control – General 3.6 Stressing, Load Testing, and Acceptance of Ground Anchors
31 50 13	TEMPORARY EXCAVATION SUPPORT AND PROTECTION	Entire Section
31 62 00	DRIVEN PILES	1.3 Reference Standards 1.4 Regulatory Requirements 1.5E. Submittal of PDF and CAPWAP Records 1.5F. Test Pile Test Reports 1.6 Quality Assurance Part 2 – Products 3.3 Indicator Piles and Test Piles 3.4 Axial Compression and Tension Load Tests 3.5 Lateral Load Tests 3.6 Dynamic Pile Testing 3.8 Installation Tolerances
31 63 29	DRILLED CONCRETE PIERS AND SHAFTS	1.3 Reference Standards 1.5 Submittals 1.6 Quality Assurance Part 2- Products 3.1 Tolerances 3.2 Method Test Shafts 3.3 Load Tests 3.8 Field Quality Control

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
Sec. No.	**DIV 32 EXTERIOR IMPROVEMENTS**	
32 11 23	AGGREGATE BASE COURSES	
32 31 13	CHAIN LINK FENCES AND GATES	Entire Section
32 90 00	PLANTING	1.3 Reference Standards 1.4 System Description 1.5 Submittals 1.6 Quality Assurance 1.9 Site Conditions and Scheduling 1.10 Warranty 2.1 Plant Stock 2.5 Herbicides 2.15 Source Quality Control 2.16 Soil Analysis Report 3.5A. Herbicide and Pesticide Application 3.9A. and 3.9B. Drainage Test and Auger Holes 3.11 Inspection Prior to Commencement of Plant Establishment Period 3.13 Plant Establishment 3.14 Plant Establishment Final Inspection and Acceptance
Sec. No.	**DIV 33 UTILITIES**	
33 05 16	UTILITY STRUCTURES	Entire Section
33 05 25	SUPPORT AND PROTECTION OF UTILITIES	Entire Section
33 05 28	TRENCHING AND BACKFILLING FOR UTILITIES	2.2B. Detectable Tape 3.4E. Detectable Tape
33 05 33	RELOCATION OF EXISTING UTILITIES	
33 11 00	WATER UTILITY DISTRIBUTION PIPING	

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
33 40 00	STORM DRAINAGE UTILITIES	
33 46 00	SUBDRAINAGE	
Sec. No.	**DIV 34 TRANSPORTATION**	
34 11 27	BALLASTED TRACK	

End of List for Construction Package 1

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ATTACHMENT 6
MANDATORY SPECIAL SPECIFICATIONS LISTING

Construction Package 1 - Special Specifications
Listing of Sections, Articles, and Paragraphs that are Contract Requirements

Notes:

1. Sections listed are for reference unless the entire Section is or parts of the Section (specific Parts, Articles, or Paragraphs) are indicated as Contract requirements. Listing of Article or Paragraph includes all Paragraphs (and subparagraphs) under listed Article or Paragraph.
2. Wherever portion of a mandatory Special Specifications Section, Part, Article, or Paragraph refers to a portion of the Special Specifications listed as reference, the referenced portion shall be considered mandatory, as directly applicable to the portion of the Special Specifications included as a Contract requirement. Otherwise, the reference specifications section, by itself, it remains as reference.

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
Sec. No.	**DIV 02 TECHNICAL GENERAL REQUIREMENTS AND EXISTING CONDITIONS**	
02 01 11.23	RECONFIGURATION OF STANISLAUS AND TUOLUMNE STREETS	
02 01 35.63	CALTRANS-IMPACTED FACILITIES	Entire Section
02 01 35.66	CITY OF FRESNO-IMPACTED FACILITIES	Entire Section
02 01 35.69	COUNTY OF FRESNO-IMPACTED FACILITIES	
02 01 55.53	ACCESS TO LA TAPATIA	Entire Section
Sec. No.	**DIV 03 CONCRETE**	
03 30 01	DESIGN AND CONSTRUCTION OF TRENCH STRUCTURES	1.6 Criteria
Sec. No.	**DIV 31 EARTHWORK**	
31 34 36	SOIL NAIL WALLS	
31 66 16	SPECIAL FOUNDATIONS	

Title		Contract Requirements Sections, Parts, and Articles and Paragraphs indicated in this Column are Contract requirements (that is, "Mandatory")
31 74 10	JACKED BOX CONSTRUCTION	2.1 Criteria, Paragraphs A. through H, I, and K. through M.
Sec. No.	**DIV 33 UTILITIES**	
33 40 00	STORM DRAINAGE UTILITIES	
Sec. No.	**DIV 35 WATERWAY AND MARINE CONSTRUCTION**	
35 40 00	WATERWAY CONSTRUCTION AND EQUIPMENT	

End of List for Construction Package 1

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ATTACHMENT 7
PROCEDURES FOR CONSTRUCTION-PHASE SUBMITTALS

Introduction

Construction-phase submittals are defined as those submittals required under the final Construction Specifications, such as shop drawings, product data, samples, certificates, test and evaluation reports, manufacturers' instructions, source quality control submittals, field quality control submittals, manufacturer reports, special procedure submittals, and qualification statements.

- Construction-phase submittals also include delegated design submittals described in the Construction Specifications which are typically drawings and calculations signed and sealed by a fabricator or manufacturer's engineer.
- Construction-phase submittals also include signed and sealed drawings and calculations for temporary works such as shoring.
- Construction-phase submittals may include submittals for approval by the Authority and others (Third Parties) and for "Statement of No Objection" (SONO) by the Authority Representative. Refer to Verification, Validation, and Self-Certification, Book 3.

1 General

This Appendix includes details for review of construction-phase submittals by the Contractor and the Contractor's engineer. It also includes minimum requirements for distribution of submittals, timing, changes, transmittal, and content.

2 Review

This Appendix assigns specific responsibilities for review of construction-phase submittals to the Contractor's engineer. The Contractor's review responsibilities designated herein facilitate the Contractor's engineer's review and approval/acceptance. Refer to Book 3, Verification, Validation, and Self-Certification, for Contractor's responsibilities for self-certification.

The Contractor shall review construction-phase submittals. At minimum, the Contractor's review shall cover the following items in order to facilitate the Contractor's engineer's review and approval or acceptance:

- Confirm that work is coordinated among trades, work is compatible with contiguous products and other work, dimensions have been checked, and sufficient information is available for systems integration.
- Coordinate each submittal with the requirements of the Work and with the contents of other submittals.
- Ensure each submittal is complete with all relevant data required for review.

The Contractor shall submit construction-phase submittals, except as otherwise specified, to the Contractor's engineer for review. Contractor's engineer shall, at minimum, confirm that the design intent is being met and work depicted in submittal is in compliance with Contract

requirements and code. Refer to Standard Specifications Section 02 01 00, Standard Specifications General Statements, for definition of Contractor's engineer.

- For Approval: Submittals such as shop drawings, product data, samples, and manufacturer or applicator qualifications shall be for the Contractor's engineer's approval, except as otherwise specified.
- For Information: Submittals such as calculations, test reports, certificates, manufacturer's instructions and field reports, and informational submittals shall be submitted for the Contractor's engineer's information and review, except as otherwise specified.
- For Information: Submittals such as drawings and calculations signed and sealed by a professional engineer, including design delegated to a fabricator or manufacturer's engineer and design of temporary works, shall be submitted for the Contractor's engineer's information and review, except as otherwise specified.

Contractor shall distribute copies of approved submittals and SONO'd submittals. At minimum, distribute copies as follows:

- Distribute to field office for use by Contractor's field QC staff and others including Authority representatives.
- Distribute hard copies and make available electronically to the Authority to facilitate office and field audits.

If acceptable to recipient of copies, submittals may be made available electronically in lieu of hard copies.

Verification, Validation, and Self-Certification shall be completed prior to construction or installation of the work which is the subject of the submittal.

3 General Submittal Requirements

Review Stamp and Action Block Space: Include a five inch by five inch square blank space, in the lower right corner, just above the title block, in which approval, requirement for resubmittal, or SONO may be indicated.

Transmittal: Accompany submittals with a transmittal listing the following information, at minimum. Coordinate this list with the Verification, Validation, and Self-Certification requirements and organize and expand the list as necessary:

- Submittal title, number, and date, and revision number, as applicable.
- Contract title and number.
- Identification of drawing or page number, date, title, revision number, and sheet number, as applicable.
- Identification of products and samples: Description, model number, style number, lot number, and place of origin as applicable.
- Supplier's, manufacturer's, or subcontractor's name, address, and telephone number.

- Engineer's name, firm name, address, and phone number for drawings and calculations signed and sealed by a Professional Engineer.
- Subject identification including Construction Drawing and Construction Specifications reference.
- Identification of referenced standards, such as ASTM standard numbers.
- Identification of location, structure number and name, and stationing, as applicable.
- Identification of deviations from Contract Documents,

4 Specific Submittal Requirements

4.1 Shop Drawings

Comply with the following requirements in regard to shop drawing submittals:

- Drawings shall be limited to the following standard sizes in inches: Maximum size shall be 22 inches by 34 inches.

WIDTH (Vertical)	LENGTH (Horizontal)
8 1/2 inches	11.0 inches
11.0 inches	8 1/2 inches
11.0 inches	17.0 inches

WIDTH (Vertical)	LENGTH (Horizontal)
17.0 inches	22.0 inches
22.0 inches	34.0 inches

- Shop drawings shall include details necessary for installation, maintenance, and repair of components provided. Each drawing shall be updated to include all changes and be upgraded to reflect the latest configuration and resubmitted.
- Where required, prepare construction-phase submittal drawings in accordance with the CHSTP CADD Manual and CHSTP Plans Preparation Manual and submit drawings electronically as well as hard copies. At minimum, shop drawings which will be utilized in Operations and Maintenance Manuals and delegated design drawings shall be prepared in accordance with these Manuals.

4.2 Product Data and Installation Instructions

Comply with the following requirements in regard to product data and installation instructions submittals:

- Delete inapplicable information from product data such as catalog cuts and from manufacturer's printed installation instructions.
- Supplement standard information with additional information applicable to the Contract.
- Indicate dimensions, clearances, performance characteristics, capacities, wiring and other diagrams, and controls.

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ATTACHMENT 8
TECHNICAL CONTRACT SUBMITTAL LIST

Attachment 8 - Technical Contract Submittal List

This list is intended to provide the Contractor with a summary of the Technical Contract Submittal requirements of the Contract Documents. Contractor shall use this list as the basis to prepare its list of submittal requirements per the Contract Documents.

CONTRACT REFERENCE (CP1)				SUBMITTAL TITLE/PACKAGE	DUE DATE	SUBMITTAL TO AUTHORITY (APPROVAL, SONO, INFORMATION)
NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
1	Scope of Work		4.9.1	Design Baseline Report	NTP + 180 days	**APPROVAL**
2	Scope of Work		4.9.5	Aesthetic Design and Review for Non-Station Structure Report (as part of Design Baseline Report)	NTP + 180 days	**APPROVAL**
3	Scope of Work		4.4	Design and Code Analysis Report	Design Submittal	SONO
4	Scope of Work		4.5	Safety and Security Certification Plan	NTP + 60 days	SONO
5	Scope of Work		4.8	Value Engineering Report	After Approval of Design Baseline Report	SONO
6	Scope of Work		4.9.2	Hydrology and Hydraulics Reports	Design Submittal	SONO
7	Scope of Work		4.9.3	Geotechnical Reports (GDR and GEDR) and all technical memoranda	Design Submittal	SONO
8	Scope of Work		4.9.3	GBR-C	Prior to beginning of construction	**APPROVAL**
9	Scope of Work		4.9.3	Geotechnical Investigation Plan (GIP)	Prior to commencement of field work	SONO
10	Scope of Work		4.9.4	Type Selection Report, including Type Selection Memo, Major Reports, and Supporting Reports	After Approval of Design Baseline Report	**APPROVAL**
11	Scope of Work		4.9.5	Structures Reports	Design Submittal	SONO
12	Scope of Work		4.9.6	Certifiable Elements and Hazards Log	Quarterly	SONO
13	Scope of Work		4.9.7	Safety and Security Certification Package	When Certifiable Items Lists for each element is completed for milestone payment	SONO
14	Scope of Work		4.9.8	Final Design Report	Design Submittal	SONO
15	Scope of Work		4.11	Nominal 60% Construction Drawings (all sheets represented) and Specifications (outline)	Design Submittal (60% Design)	SONO
16	Scope of Work		4.11	Nominal 90% Construction Drawings (all sheets included) and Specifications (all specs included)	Design Submittal (90% Design)	SONO
17	Scope of Work		4.11	Survey Reports (signed and sealed) - Refer to Standard Specifications	Design Submittal	SONO
18	Scope of Work		4.12	Copy of Third-Party Design Submittals and Approvals	Design Submittal	Per V&V Document (Book 3)
19	Scope of Work		4.13	Ready for Construction Submittals (signed and sealed)	Prior to beginning of construction	**APPROVAL**
20	Scope of Work		4.14	Design Variance Requests	As needed, but Prior to incorporation into RFC	**APPROVAL**
21	Scope of Work		4.15.1	Site-Specific Health and Safety Plan	NTP + 60 days	SONO
22	Scope of Work		4.15.1	Site-Specific Security Plan	NTP + 60 days	SONO
23	Scope of Work		4.15.2	Hazardous Materials Remediation Plan	Prior to performing the hazardous material removal work	**APPROVAL**
24	Scope of Work		4.15.4	Construction-Phase Submittals - Refer to Standard Specifications	Per Standard Specifications	Per Standard Specifications

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CONTRACT REFERENCE (CP1)				SUBMITTAL TITLE/PACKAGE	DUE DATE	SUBMITTAL TO AUTHORITY (APPROVAL, SONO, INFORMATION)
NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
25	Scope of Work		4.15.5	As-Builts (signed and sealed)		SONO
26	Scope of Work		4.15.6	List of Mitigation Measures - Refer to other Contract Requirements		SONO
27	Scope of Work		5.1	Demolition Plan	Prior to demolition work	SONO
28	Scope of Work		5.4	Trackbed Analysis Report	Design Submittal	SONO
29	Scope of Work		5.17.1	Contractor RAM Program Plan (CRMP) - Final	NTP + 60 days	SONO
30	Scope of Work		5.17.1	Contractor RAM Program Plan (CRMP) - Draft	NTP + 90 days	SONO
31	Scope of Work		5.17.1	RAM Allocation Report	Baseline Design Report Submittal	SONO
32	Scope of Work		5.17.1	Historical Product Maintainability Report (HPMR)	Baseline Design Report Submittal	SONO
33	Scope of Work		5.17.1	Maintenance Manuals	Final Design Report Submittal	SONO
34	Scope of Work		5.17.1	Reliability-Centered Maintenance (RCM)	Final Design Report Submittal	SONO
35	Scope of Work		5.17.1	Preventive Maintenance Analysis (PMA)	Final Design Report Submittal	-
36	Scope of Work		5.17.1	Corrective Maintenance Analysis (CMA)	Final Design Report Submittal	-
37	Scope of Work		5.17.1	Maintainability Demonstration Plan and Procedure (MDPP)	Final Design Report Submittal	SONO
38	Scope of Work		5.17.1	Maintainability Demonstration Test Report (MDTR)	Before or with Substantial Completion approval request	SONO
39	Scope of Work		5.18	Design Life and Durability Report	Final Design Report Submittal	SONO
40	Design Criteria Manual, Rev. 0	CH 7 - Civil	7.8.1.5	An alternative method of providing vehicular access to the trackside from the Authority facility	Baseline Design Report Submittal	**APPROVAL**
41	Design Criteria Manual, Rev. 0	CH 7 - Civil	7.8.4.3	Case 2 Concrete Barrier Wall Design Drawings	Design Submittal	**APPROVAL**
42	Design Criteria Manual, Rev. 0	CH 7 - Civil	7.10.3	Design drawings for temporary structures for the support and maintenance of surface traffic adjacent to and/or over the construction site	Construction Submittals	SONO
43	Design Criteria Manual, Rev. 0	CH 9 - Utilities	9.5.3	Request for access to non-CHST utilities from the Authority's right-of-way	Design Submittal	SONO
44	Design Criteria Manual, Rev. 0	CH 9 - Utilities	9.5.5.4	Utility protection and monitoring plan (provided to the utility owner)	Construction Submittals	INFORMATION
45	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10.4/ 10-C.3	Qualifications of boring, in-situ testing inspection staff as well as rock mapping staff and the blasting specialist	Design Submittal	SONO
46	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10.6.4.3	Results of the Drivability Analysis	Design Submittal	SONO
47	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10.6.4.3	Indicator pile and testing results	Construction Submittals	SONO
48	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10.12.4.4	Verification of Numerical Program	Design Submittal	SONO
49	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10-C.3	Rock Mapping Records	Design Submittal	INFORMATION
50	Design Criteria Manual, Rev. 0.1	CH 10 - Geotechnical	10-C.5.1	Blasting Plan	Design Submittal	SONO

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CONTRACT REFERENCE (CP1)				SUBMITTAL TITLE/PACKAGE	DUE DATE	SUBMITTAL TO AUTHORITY (APPROVAL, SONO, INFORMATION)
NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
51	Design Criteria Manual, Rev. 0.1	CH 11 - Seismic	11.3	Seismic Analysis and Design Plan	Design Submittal	**APPROVAL**
52	Design Criteria Manual, Rev. 0.1	CH 12 - Structures	12.6.8.6	Rail Stress and Fastener Design and Analysis Plan	Design Submittal	**APPROVAL**
53	Design Criteria Manual, Rev. 0.1	CH 12 - Structures	12.8.1.1	Bridge Type Selection Submittals as described in the Caltrans OFSP Procedures	Design Submittal	**APPROVAL**
54	Design Criteria Manual, Rev. 0.1	CH 12 - Structures	12.8.7	Complex and Non-Standard Aerial Structures Load Path Report	Design Submittal	**APPROVAL**
55	Design Criteria Manual, Rev. 0.1	CH 12 - Structures	12.11.3	A list of a minimum of five successful waterproofing system projects of similar design and complexity completed within the past five years	Construction Submittals	SONO
56	Design Criteria Manual, Rev. 0	CH 13 - Tunnels	13.8.1	Examples of where the load design method has been used before for tunnel design, and verification of the assumptions made about the behavior of the ground or the lining	Design Submittal	INFORMATION
57	Verification, Validation and Self-Certification		2.1	Verification and Validation Plan - Draft	NTP + 60 days	SONO
58	Verification, Validation and Self-Certification		2.1	Verification and Validation Plan - Final	NTP + 90 days	SONO
59	Verification, Validation and Self-Certification		2.1	Verification and Validation Plan - Update	Design Submittal	INFORMATION
60	Verification, Validation and Self-Certification		2.2	RM Tool - Licenses	NTP + 30 days	INFORMATION
61	Verification, Validation and Self-Certification		2.2	RM Tool - Database	Monthly	SONO
62	Verification, Validation and Self-Certification		3.2	Key personnel resumes	During mobilization & prior to hiring	SONO
63	Verification, Validation and Self-Certification		3.3	ICE/ISE assessment plan - draft	NTP + 60 days	SONO
64	Verification, Validation and Self-Certification		3.3	ICE/ISE assessment plan - final	NTP + 90 days	SONO
65	Verification, Validation and Self-Certification		3.3	ICE/ISE monthly progress & status report	Monthly	INFORMATION
66	Verification, Validation and Self-Certification		3.3	ICE/ISE quarterly progress & status report	Quarterly	INFORMATION
67	Verification, Validation and Self-Certification		2.6	V&V Submittal (RM tool data copy, RVTM, CIL and V&V report)	Baseline Design Report Submittal	SONO
68	Verification, Validation and Self-Certification		3.1	Contractor Self Certification	Baseline Design Report Submittal	SONO
69	Verification, Validation and Self-Certification		3.3	ICE/ISE Assessment Report and Certificate	Baseline Design Report Submittal	SONO
70	Verification, Validation and Self-Certification		2.6	V&V Submittal (RM tool data copy, RVTM, CIL and V&V report)	Milestone Design Submittals	SONO
71	Verification, Validation and Self-Certification		3.1	Contractor Self Certification	Milestone Design Submittals	SONO
72	Verification, Validation and Self-Certification		3.3	ICE/ISE Assessment Report and Certificate	Milestone Design Submittals	SONO
73	Verification, Validation and Self-Certification		2.6	V&V Submittal (RM tool data copy, RVTM, CIL and V&V report)	Design Submittal	SONO
74	Verification, Validation and Self-Certification		3.1	Contractor Self Certification	Design Submittal	SONO
75	Verification, Validation and Self-Certification		3.3	ICE/ISE Assessment Report and Certificate	Design Submittal	SONO
76	Verification, Validation and Self-Certification		2.6	V&V Submittal (RM tool data copy, RVTM, CIL and V&V report)	Construction Submittals	SONO
77	Verification, Validation and Self-Certification		3.1	Contractor Self Certification	Construction Submittals	SONO
78	Verification, Validation and Self-Certification		3.3	ICE/ISE Assessment Report and Certificate	Construction Submittals	SONO
79	Verification, Validation and Self-Certification		2.6	V&V Submittal (RM tool data copy, RVTM, CIL and V&V report)	As-Built Submittals	SONO
80	Verification, Validation and Self-Certification		3.1	Contractor Self Certification	As-Built Submittals	SONO
81	Verification, Validation and Self-Certification		3.3	ICE/ISE Assessment Report and Certificate	As-Built Submittals	SONO
82	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.B	A survey plan for establishing, controlling, and checking the positions for all work products and deliverables	As needed	INFORMATION

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CONTRACT REFERENCE (CP1)				SUBMITTAL TITLE/PACKAGE	DUE DATE	SUBMITTAL TO AUTHORITY (APPROVAL, SONO, INFORMATION)
NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
83	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.C	A report of surveys and computations made for the purposes of densification of survey control	As needed	INFORMATION
84	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.D	One signed copy of each survey document to the Authority for record purposes.	As needed	INFORMATION
85	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.E	Mapping or Digital Terrain Model (DTM) products developed from photogrammetry or scanning technology	As needed	SONO
86	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.F	A report including methods used, survey control set or utilized, field checks made, accuracy performance achieved, etc. Include CADD files.	As needed	INFORMATION
87	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.G	Survey report of all found or set monuments controlling land boundaries	As needed	SONO
88	Standard Specifications (Mandatory) Site Surveys	02 21 13	1.3.H	Survey report of all field ties made for items such as existing features, locations of potholes, geotechnical borings, horizontal and vertical clearances to major structures or facilities, and catenary wire sag	As needed	INFORMATION
89	Standard Specifications (Mandatory) Field Engineering	02 21 23	1.3.A	A survey plan for establishing, controlling, and checking the layout for all work. with a plan sheet showing the horizontal distance, azimuth, and angle from the control points	As needed	INFORMATION
90	Standard Specifications (Mandatory) Field Engineering	02 21 23	1.3.B	Survey showing actual as-built conditions for all work indicating its conformance to the Contract Documents	As needed	SONO
91	Standard Specifications (Mandatory) Field Engineering	02 21 23	1.3.C	Submit for each element of work constructed survey showing actual as-built conditions.	As needed	SONO
92	Standard Specifications (Mandatory) Photographic Documentation	02 21 33	1.3	Photographs and digital video recording of project site:	1. Before commencement of clearing, demolition, and subsurface work. 2. Upon completion of clearing and demolition. 3. Upon completion of subsurface work. 4. Monthly during performance of the Work, or more frequently as needed. 5. At all construction milestones 6. Upon completion of the Work.	INFORMATION
93	Standard Specifications (Mandatory) Photographic Documentation	02 21 33	1.5.A and B	Digital video recordings of all construction milestones and the following events	1. Prior to Construction 2. Start of Construction	INFORMATION
94	Standard Specifications (Mandatory) Photographic Documentation	02 21 33	1.5.C	Format and quality of uploaded recordings to Authority's web portal.	As needed	SONO

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NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
95	Standard Specifications (Mandatory) Photographic Documentation	02 21 33	1.6.A	Color aerial photographs of the entire job site	As needed	INFORMATION
96	Standard Specifications (Mandatory) Photographic Documentation	02 21 33	1.8.A	Aerial photographs of the entire Jobsite	As needed	INFORMATION
97	Standard Specifications (Mandatory) Existing Conditions Assessment	02 22 00	1.3.A	Preconstruction Condition Survey Report.	As needed	INFORMATION
98	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.A	Concrete Mix Designs	As needed	INFORMATION
99	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.B	Manufacturer's product data for proposed concrete admixtures	As needed	SONO
100	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.C	Aggregate source	As needed	SONO
101	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.D	Affidavits/Certificates for cement, aggregate, supplementary cementitious materials, and admixtures	As needed	INFORMATION
102	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.E	Batch Tickets	As needed	-
103	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	1.6.F	Name, address, and telephone number of the laboratory, agency, mill, or ready-mix plant	As needed	INFORMATION
104	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	2.1.C.1	Source of Special Aggregates	As needed	SONO
105	Standard Specifications (Mandatory) Portland Cement Concrete	03 05 15	2.1.D	Concrete Admixture and Cementitious Materials	As needed	SONO
106	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.A	Test results and certifications re. Post-Tensioning System	As needed	SONO
107	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.B	Shop drawings	As needed	INFORMATION
108	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.C	Safety Plan	As needed	INFORMATION
109	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.D	Grouting Operations Plan	As needed	INFORMATION
110	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.E	Product Data	As needed	SONO
111	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.F	Certification	As needed	INFORMATION
112	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.G	Grouting Report	Within 72 hours of each grouting operation	INFORMATION
113	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.H	Field Test Reports	As needed	INFORMATION

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114	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.I	Elastomeric Coating Applicator Qualifications	As needed	INFORMATION
115	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.6.J	Prestressing Firm Qualifications	As needed	SONO
116	Standard Specifications (Mandatory) Prestressed Concrete	03 05 18	1.7.C	Certification of independent laboratory if outside the U.S.	As needed	SONO
117	Standard Specifications (Mandatory) Falsework	03 11 14	1.4.A	Shop drawings and supporting calculations for falsework	As needed	INFORMATION
118	Standard Specifications (Mandatory) Falsework	03 11 14	1.4.B	Form design and materials data	As needed	INFORMATION
119	Standard Specifications (Mandatory) Falsework	03 11 14	1.4.C	Falsework lighting plan	As needed	INFORMATION
120	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.A	Product Data	As needed	INFORMATION
121	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.B	Samples	As needed	INFORMATION
122	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.C	Certified Test Reports	As needed	INFORMATION
123	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.D	Installer Qualifications and Procedures	As needed	INFORMATION
124	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.E	Installation and Field Quality Control Methods	As needed	INFORMATION
125	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.F	Certificates	As needed	INFORMATION
126	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.G	installation and Testing Methods	As needed	INFORMATION
127	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.H	Documentation	As needed	INFORMATION
128	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.H.4	Failed Anchor Documentation	As needed	SONO
129	Standard Specifications (Mandatory) Concrete Anchors	03 15 23	1.6.I	Record Documents	As needed	INFORMATION
130	Standard Specifications (Mandatory) Concrete Reinforcing	03 20 00	1.4.A	Shop drawings for all reinforcing steel	As needed	INFORMATION
131	Standard Specifications (Mandatory) Concrete Reinforcing	03 20 00	1.4.B	Product Data	As needed	INFORMATION
132	Standard Specifications (Mandatory) Concrete Reinforcing	03 20 00	1.4.C	Certificates	As needed	INFORMATION
133	Standard Specifications (Mandatory) Cast-In-Place Concrete	03 30 00	1.4.A	Shop Drawings	As needed	INFORMATION

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134	Standard Specifications (Mandatory) Cast-In-Place Concrete	03 30 00	1.4.B	Product Data	As needed	INFORMATION
135	Standard Specifications (Mandatory) Cast-In-Place Concrete	03 30 00	1.4.C	Records and Reports	As needed	INFORMATION
136	Standard Specifications (Mandatory) Cast-In-Place Concrete	03 30 00	1.5.C.1	Site Mock-ups	As needed	SONO
137	Standard Specifications (Mandatory) Concrete Finishing	03 35 00	1.5.C and D	Site Mock-ups	As needed	SONO
138	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.5.A	Shop Drawings	As needed	INFORMATION
139	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.5.B	Product Data	As needed	INFORMATION
140	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.5.C	Samples	As needed	INFORMATION
141	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.5.D	Certificates	As needed	INFORMATION
142	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.6.E	Mock-ups	As needed	SONO
143	Standard Specifications (Mandatory) Precast Concrete	03 40 00	1.6.F	Control Samples	As needed	SONO
144	Standard Specifications (Mandatory) Precast Concrete Segmental Construction	03 43 00	1.6.A	Shop drawings and calculations for precast concrete segmental construction, Casting manual, Erection Manual, etc.	As needed	SONO
145	Standard Specifications (Mandatory) Precast Concrete Segmental Construction	03 43 00	1.6.B	Qualifications of personnel	As needed	INFORMATION
146	Standard Specifications (Mandatory) Precast Concrete Segmental Construction	03 43 00	1.6.C	Record of Jointing	As needed	INFORMATION
147	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.B	Gradation of Aggregates	As needed	INFORMATION
148	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.C	Temperature Control Plan	As needed	INFORMATION
149	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.D	Repairs methods or corrective actions	As needed	INFORMATION
150	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.E	Layout of cooling pipe system if used	As needed	INFORMATION
151	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.F	Concrete Placement Plan	As needed	INFORMATION
152	Standard Specifications (Mandatory) Mass Concrete	03 70 00	1.4.G	Daily reports of temperature monitoring of concrete	As needed	INFORMATION
153	Standard Specifications (Mandatory) Metal Welding	05 05 22	1.5.A	Shop Drawings	As needed	INFORMATION

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NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
154	Standard Specifications (Mandatory) Metal Welding	05 05 22	1.5.B	Welder Qualifications	As needed	INFORMATION
155	Standard Specifications (Mandatory) Metal Welding	05 05 22	1.5.C	Welding Procedure Specifications (WPS)	As needed	INFORMATION
156	Standard Specifications (Mandatory) Metal Welding	05 05 22	1.5.D	Welding Records and Data	As needed	INFORMATION
157	Standard Specifications (Mandatory) Metal Welding	05 05 22	1.5.E	Mill Certificates	As needed	INFORMATION
158	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.A	Shop drawings	As needed	INFORMATION
159	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.B	Product data	As needed	INFORMATION
160	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.C	Mill Test Reports	As needed	INFORMATION
161	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.D	Fabrication Qualifications	As needed	INFORMATION
162	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.E	High-Strength Bolted Connection Reports	As needed	INFORMATION
163	Standard Specifications (Mandatory) Structural Steel Framing	05 12 00	1.4.F	Welding Records and Data	As needed	INFORMATION
164	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.A	Shop drawings	As needed	INFORMATION
165	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.B	Calculations	As needed	INFORMATION
166	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.C	Weld procedures	As needed	INFORMATION
167	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.D	Product Data	As needed	SONO
168	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.E	Certificates of Compliance	As needed	INFORMATION
169	Standard Specifications (Mandatory) Bridge Bearings	07 95 63	1.4.F	Factory Quality Control Test Procedures and Results	As needed	INFORMATION
170	Standard Specifications (Mandatory) Bridge Expansion Joint Assemblies	07 95 66	1.4.A	Product data and shop drawings for the expansion joint system	As needed	SONO
171	Standard Specifications (Mandatory) Bridge Expansion Joint Assemblies	07 95 66	1.4.B	Certifications of compliance	As needed	INFORMATION
172	Standard Specifications (Mandatory) Bridge Expansion Joint Assemblies	07 95 66	1.4.C	Fire rating certification	As needed	INFORMATION
173	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.A	Product Data and Manufacturer's Certification	As needed	SONO

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174	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.B	Detailed Coating Schedule	As needed	INFORMATION
175	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.C	Samples for verification purposes	As needed	INFORMATION
176	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.D	Manufacturer's Project Acceptance Document	As needed	INFORMATION
177	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.E	Maintenance Instructions	As needed	INFORMATION
178	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.F	Applicator's qualifications	As needed	INFORMATION
179	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.G	Manufacturer's Technical Representative Qualifications	As needed	INFORMATION
180	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.H	Independent Coating inspector's qualifications	As needed	INFORMATION
181	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.I	Contractor's Field Quality Control	As needed	INFORMATION
182	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.J	Independent Coating Inspector's Reports	As needed	INFORMATION
183	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.K	Manufacturer Technical Representative Reports	As needed	INFORMATION
184	Standard Specifications (Mandatory) High-Performance Coatings	09 96 00	1.6.L	Reports	As needed	SONO
185	Standard Specifications (Mandatory) Common Work Results for Earthwork	31 05 00	1.6.A	Permits	As needed	INFORMATION
186	Standard Specifications (Mandatory) Common Work Results for Earthwork	31 05 00	1.6.B	Private Property Owner's Release	No more than 15 days prior to start of work	INFORMATION
187	Standard Specifications (Mandatory) Common Work Results for Earthwork	31 05 00	1.6.C	Delivery Tickets	As needed	-
188	Standard Specifications (Mandatory) Common Work Results for Earthwork	31 05 00	1.6.D	Field Verification for In-Situ Treatment	As needed	INFORMATION
189	Standard Specifications (Mandatory) Common Work Results for Earthwork	31 05 00	1.6.E	Test Reports	As needed	INFORMATION
190	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.A	Shop Drawings	Minimum of 60 days prior to installation	SONO
191	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.B	Documentation	Prior to installation and during monitoring as stated	SONO

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192	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.C	Certifications	Minimum of 60 days prior to installation	SONO
193	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.D	Monitoring Documentation	Within 12 hours after monitoring any instrument	SONO
194	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.E	Mix Designs	Prior to start of work	SONO
195	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.5.F	Closure Report	Upon removal of instrumentation	SONO
196	Standard Specifications (Mandatory) Geotechnical Instrumentation and Monitoring	31 09 13	1.4 F. thru I, L and M.	Design information as required by referenced paragraphs including all proposed remedial measures.	Minimum of 60 days prior to installation	**APPROVAL**
197	Standard Specifications (Mandatory) Clearing and Grubbing	31 11 00	1.4.A	Utility Severance Certificates	As needed	INFORMATION
198	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5A	Pre-construction surveys	As needed	INFORMATION
199	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5B	Procedures for detection of movement and records of movement detection	As needed	SONO
200	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5C	Shop Drawings and design data of dewatering system	Prior to installation of dewatering system	INFORMATION
201	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5D	Copies of permits required for performing the work of this Section	As needed	SONO
202	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5E	Records of monitoring and movement	One day after the reading	SONO
203	Standard Specifications (Mandatory) Dewatering	31 23 19	1.5F	Observation Records and Water Quality test results	During dewatering operation	INFORMATION
204	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.A	Product Data		INFORMATION
205	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.B.B	Design Submittal	Minimum of 60 days prior to start of earth structure system construction	**APPROVAL**
206	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.C	Shop drawings and calculations	As needed	INFORMATION
207	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.D	Record of drawings	As needed	INFORMATION
208	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.E	Certificates of Compliance	As needed	INFORMATION
209	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.F	Field Construction Manual	As needed	INFORMATION

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210	Standard Specifications (Mandatory) Reinforced Slopes and Earth Structures	31 38 13	1.5.G	Qualifications of Independent Testing Agency	As needed	INFORMATION
211	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.A	Calculations for design of the tendons, unbonded lengths, bonded lengths, bearing plates, bearing stiffeners, and wedge plates	As needed	INFORMATION
212	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.B	Shop Drawings	As needed	INFORMATION
213	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.C	Manufacturer’s Instructions	As needed	INFORMATION
214	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.D	Grout mix design	As needed	INFORMATION
215	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.E	Mill test reports for prestressing steel and bearing plate steel	As needed	INFORMATION
216	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.F	Calibration data for each test jack, load cell, primary pressure gage, and reference pressure gage to be used	As needed	INFORMATION
217	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.G	Grouting records	As needed	INFORMATION
218	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.H	Test data and results for all testing required	As needed	SONO
219	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.I	Driller’s qualifications	As needed	SONO
220	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.J	Anchor Tieback Design Engineer’s qualifications	As needed	SONO
221	Standard Specifications (Mandatory) Ground Anchors	31 39 13	1.5.K	Details of destressing and removal of temporary anchors	As needed	SONO
222	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.A	A written procedure, along with detailed drawings, of the proposed excavations and excavation support systems	As needed	SONO
223	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.B	Detailed drawings for support systems	As needed	SONO
224	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.C	Design calculations	As needed	SONO
225	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.D	Professional Engineer's Certification	As needed	SONO
226	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.E	Check calculations and related documents prepared, signed, and sealed by an independent civil or structural engineer currently registered in the State of California	As needed	SONO

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227	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.F	Copies of permissions from adjacent property owners for extending excavations and support systems beyond Authority property	As needed	SONO
228	Standard Specifications (Mandatory) Temporary Excavation Support and Protection	31 50 13	1.5.G	Proposed engineer's resume showing required experience	As needed	SONO
229	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.A	Shop Drawings	As needed	INFORMATION
230	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.B	Pile Driving Sequential Layout	As needed	INFORMATION
231	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.C	Pile tip elevation	Prior to ordering production piles	SONO
232	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.D	Pile driving record	Upon completion of driving piles	INFORMATION
233	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.E	Pile Driving Analyzer (PDA) and Case Pile Wave Analysis Program (CAPWAP) Records	Within 5 days after completion of PDA testing	INFORMATION
234	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.F	Test report for each test pile	Immediately following completion of load testing	INFORMATION
235	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.G	Equipment Review and Drawings	14 days prior to pile driving	INFORMATION
236	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.5.H	Specialty Consultant Qualifications	As needed	SONO
237	Standard Specifications (Mandatory) Driven Piles	31 62 00	1.6.D	Replacing damaged piles or driven out of position	As needed	SONO
238	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.A	Qualifications of the Drilled Shaft Entity	As needed	SONO
239	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.B	Drilled Shaft Sequential Layout Drawings	As needed	INFORMATION
240	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.C	Concrete reinforcement submittals	As needed	INFORMATION
241	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.D	Qualifications of Welders and Welding Procedures	As needed	INFORMATION
242	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.E	Portland Cement Concrete submittals	As needed	INFORMATION
243	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.F	Drilling equipment descriptions	As needed	INFORMATION
244	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.G	Temporary Casing	As needed	INFORMATION
245	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.H	Slurry submittals - description of procedures for mixing, using, maintaining, and disposing of slurry, proposed slurry mix design and a detailed plan for quality control	As needed	INFORMATION

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246	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.I	Shop Drawings	As needed	INFORMATION
247	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.J	Product Data	As needed	INFORMATION
248	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.K	Mitigation plans for each rejected drilled shaft	As needed	INFORMATION
249	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.L	daily reports and shaft record reports or logs as required by ADSC Standards and Specifications	As needed	INFORMATION
250	Standard Specifications (Mandatory) Drilled Concrete Piers and Shafts	31 63 29	1.6.M	Testing Procedures	As needed	INFORMATION
251	Standard Specifications (Mandatory) Chain Link Fences and Gates	32 31 13	1.3.A	Product Data	As needed	INFORMATION
252	Standard Specifications (Mandatory) Chain Link Fences and Gates	32 31 13	1.3.B	Shop drawings	As needed	INFORMATION
253	Standard Specifications (Mandatory) Chain Link Fences and Gates	32 31 13	1.3.C	Design submittals	As needed	INFORMATION
254	Standard Specifications (Mandatory) Chain Link Fences and Gates	33 31 13	1.3.D	Samples	As needed	INFORMATION
255	Standard Specifications (Mandatory) Chain Link Fences and Gates	32 31 13	1.3.E	Manufacturer's color chart of available colors and physical sample of selected color	As needed	INFORMATION
256	Standard Specifications (Mandatory) Planting	32 90 00	1.5.A	Soil Analysis Report	As needed	INFORMATION
257	Standard Specifications (Mandatory) Planting	32 90 00	1.5.B	Product Data	As needed	INFORMATION
258	Standard Specifications (Mandatory) Planting	32 90 00	1.5.C	Product Data for Toxicity	As needed	INFORMATION
259	Standard Specifications (Mandatory) Planting	32 90 00	1.5.D	Samples	As needed	INFORMATION
260	Standard Specifications (Mandatory) Planting	32 90 00	1.5.E	List of Plant Materials	As needed	INFORMATION
261	Standard Specifications (Mandatory) Planting	32 90 00	1.5.F	Inspection Certification	With each delivery	INFORMATION
262	Standard Specifications (Mandatory) Planting	32 90 00	1.5.G	Plant Substitution	NTP + 30 days	SONO
263	Standard Specifications (Mandatory) Utility Structures	33 05 16	1.5.A	Shop drawings	As needed	INFORMATION
264	Standard Specifications (Mandatory) Utility Structures	33 05 16	1.5.B	Product Data	As needed	INFORMATION
265	Standard Specifications (Mandatory) Utility Structures	33 05 16	1.5.C	Certification	As needed	INFORMATION

Attachment 8 - Technical Contract Submittal List

This list is intended to provide the Contractor with a summary of the Technical Contract Submittal requirements of the Contract Documents. Contractor shall use this list as the basis to prepare its list of submittal requirements per the Contract Documents.

CONTRACT REFERENCE (CP1)				SUBMITTAL TITLE/PACKAGE	DUE DATE	SUBMITTAL TO AUTHORITY (APPROVAL, SONO, INFORMATION)
NO.	DESIGNATION	SECTION NO./ CHAPTER	ARTICLE			
266	Standard Specifications (Mandatory) Utility Structures	33 05 16	1.5.D	Third Party Utility Structures	As needed	INFORMATION
267	Standard Specifications (Mandatory) Support and Protection of Utilities	33 05 25	1.2.A	A copy of updated, verified list of names of the utility companies and their respective addresses and telephone numbers for information	NTP + 90 days, and updates as needed	INFORMATION
268	Standard Specifications (Mandatory) Support and Protection of Utilities	33 05 25	1.2.B	Schedule of estimated shut-down times to jurisdictional authorities and obtain permission for shut-downs	90 days prior to scheduled shut down	INFORMATION
269	Standard Specifications (Mandatory) Support and Protection of Utilities	33 05 25	1.2.C	Schedule of approved shut-down times	Upon approval by the utility companies	INFORMATION
270	Standard Specifications (Mandatory) Trenching and Backfiling for Utilities	33 05 28	2.2.B.3	Legends	As needed	SONO